

**CALIFORNIA STATE ROUTE 36
HUMBOLDT COUNTY**

CA FLAP SR 36 (13)

PAVEMENT & MATERIALS REPORT

Report # 14-03

**Technical Service Branch
July 2014**



SIGNATURE SHEET

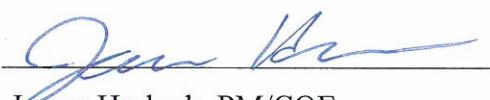
Report prepared by:


Steve Deppmeier, Staff Materials & Pavements Engineer

Report reviewed by:


Mike Voth, Pavements Technical Leader

Report reviewed by:


James Herlyck, PM/COE

Approved for distribution by:


Mike Peabody, Supervisory Materials & Pavements Engineer

7/14/14

Date

Distribution

Project Management
Project Development (3)
Construction (2)
CFLHD, Central Files
CFLHD, Report Room
Materials & Pavements (3)

TABLE OF CONTENTS

I. INTRODUCTION	1
II. CLIMATE, GEOLOGY & SOILS, and EXISTING PAVEMENT.....	2
III. EXPLORATION.....	3
IV. TESTING RESULTS	4
V. RECOMMENDATIONS & DISCUSSION	6
APPENDICES	9
A – Location Map	
B – Laboratory Test Results	
C – Photographs	
D – Pavement Design Calculations	
E – Traffic Data	
F – Field Data Summary	

RECOMMENDED PAVEMENT STRUCTURAL SECTION

California State Route 36

MP 36.0 to 39.9

Re-construction

6 inches HACP (Hot Asphalt Concrete Pavement)
9 inches Aggregate Base Course

I. INTRODUCTION

This report consolidates information from two previous geotechnical and pavement investigations along with information provided by the California Department of Transportation (Caltrans) to provide a concise report for this upcoming project CA FLAP SR 36 (13) California State Route 36 Humboldt County. This project will be reconstructed from milepost (MP) 36.0 to 40.4. Due to the proposed new alignment and curve flattening the route will be shortened by 0.5 miles. The end point will now be MP 39.9, which is adjacent to the bridge spanning the Van Duzen River and entering the hamlet of Dinsmore.

SR 36 is a significant regional, west-east route serving Humboldt County between the Pacific Coast and Sacramento Valley. SR 36 originates at its junction with United States Highway 101 (US 101) just south of Fortuna, California, and proceeds east along the Van Duzen River Valley through Grizzly Creek State Park to end at its junction with Route 395 at Susanville, California, east of Interstate 5 (I-5). SR 36 is one of only four routes between US 101 and I-5 that crosses the northern coast mountain ranges along the 375-mile stretch of US 101 between San Francisco and the California state line with Oregon. SR 36 is a two-lane facility with 0 to 2 foot shoulders and generally operates between 35 mph and 55 mph.

This is the 17th project that Central Federal Lands Highway Division (CFLHD) has designed and will perform construction contract administration and acceptance on this portion of CA SR 36. Previous projects were classified under the old forest highway program with project numbers such as CA PFH 4-1(12) Van Duzen – Peanut.

This segment of SR 35 is not an engineered alignment and does not comply with the American Association of Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets or the Caltrans Highway Design Manual.

The existing roadway narrows to as little as 20 feet in width with no centerline stripe in most locations. The roadway geometry is poor with horizontal curve radii as low as 50 foot, vertical grades up to 18%, and severely limited sight distance. Large trees, vertical cut banks, and steep fill slopes lie at the edge-of-pavement leaving no shoulder and no clear zone. There are no paved pullouts or auxiliary lanes within the project limits. There are a few short (200 feet or less) unpaved, narrow pullouts that provide limited opportunities for slow-moving vehicles to temporarily pull-over.

The surrounding topography is generally steep with tall cut and fill slopes. The underlying geology is highly variable with a significant portion of the route lying on active or ancient landslides. There are also mapped fault zones within the project limits. The northern portion of the route is adjacent to the Van Duzen River, a designated Wild and Scenic River. Approximately 500 feet of the road lies in the 100-year flood plain of this river and was inundated during the 1997 flood event. There are numerous seeps and springs above and below the road, a few unnamed streams that cross the road, and one larger stream, Burr Creek, which crosses the road. Existing culvert diameters range from 18 inches to 102 inches.

II. CLIMATE, GEOLOGY & SOILS, and EXISTING PAVEMENT

Climate

Project elevation ranges from 2300 feet to 2900 feet. Annual precipitation averages 74.2 inches. Summers are dry with 80% of precipitation falling from November to March including snow. Numerous perennial and seasonal springs are observed throughout the project, with increased flow during the winter and spring seasons. The area is moderately wooded.

The average air temperature for the town of Bridgeville, approximately 11 miles to the west and at an elevation of 636 feet is approximately 52° F. The average low temperature for Bridgeville ranges from 38° F in December and January to 53° F in July and August; and for the construction season the average high temperatures of the day from April through October range from 60° F to 74° F.

Geology & Soils

The project lies within the Central belt of the Franciscan Complex in the Coast Range Geologic Province. The Central belt consists predominately of mélange characterized by interlayered slabs and blocks of more coherent broken and folded sequences of sandstone and shale turbidites.

The project crosses both dormant and active landslides from MP 37.35 to MP 39.50. These landslides are assumed to originate from the weathered and sheared mélange formation and activated from perched and high groundwater. The landslides as a whole extend from the ridgeline at approximate elevation of 4000 feet to the Van Duzen River at about 2000 feet. The landslides generally appear to be large, complex geometry rotational slides.

Cut and fill slope instability is observed throughout the existing roadway and is likely to continue. Slumps and potouts have occurred at many cut and fill locations requiring buttresses, re-grading, and enhanced drainage. In general, slumps and potouts appear to occur in over steepened slopes with seeps, springs, and poor surface water flow.

Caltrans built a soldier pile and tieback wall at MP 40.35 in 2009 that appears to have halted movement at this location.

Existing Pavement

Caltrans actively maintains SR 36 and the pavement condition reflects this progressive approach. Very few cracks were observed for the whole existing 4.5 miles roadway during a field review in October 2013. Caltrans has related that due to slumps and slides. Portions of this roadway are paved annually and in wet years with more movement, twice a year. One field investigation boring recorded 48 inches of asphalt pavement. As this area settled a new leveling overlay would be applied. See photo at approximately MP 36.8 in Appendix D.

III. EXPLORATION

CFLHD geotechnical personnel conducted a preliminary subsurface investigation from March 4 to 25, 2013 to characterize and to instrument known landslide locations. The subsurface exploration program consisted of drilling a total of 20 borings; and installing 10 inclinometers and adjacent piezometers. Selected soil and rock core samples were tested to classify material and to determine material properties for design. Two samples had R-Value tests performed for preliminary pavement design purposes.

From September through October 2013 Kleinfelder, Inc. performed a more in-depth subsurface investigation for the geotechnical design team. Information and test results from samples collected during this phase were used to validate the preliminary pavement design. Pavement thicknesses were recorded for borings within the pavement.

Kleinfelder also investigated a wetland mitigation site 2 miles east of Dinsmore. This was a waste site from a previous road construction project a number of years ago. Currently, at the time of writing this report, the design phase is progressing from 30% to 70% Plans, the waste site is still a potential borrow source. A final decision concerning this site will be made at a later date. Test results of the site are included in the Kleinfelder documentation, Appendix B.

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLDT COUNTY

In addition Caltrans District 1 provided a summary of information from their achieved files for the location of this current project. All three sources of information are presented in the following section.

IV. TEST RESULTS

SR 36 is a west to east route with MP 0.00 beginning at the intersection with US 101 near the community of Alton, just south of Fortuna in Humboldt County. Dinsmore is at approximately MP 42.

Pavement thickness from Caltrans District 1 was collected in October 2011. Caltrans R-Value information was from a database as samples were collected over the past 21 years. CFLHD pavement thickness and R-Value samples were collected in March 2013. Kleinfelder pavement thickness and R-Value samples were collected in September and October 2013. See Appendix B for Laboratory Test Results and Appendix G for Field Data Summary.

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLDT COUNTY

Table 1: MP 36 to MP 40.5 Summary

Milepost	Caltrans HACP (inches)	CFLHD HACP (inches)	Kleinfelder HACP (inches)	Caltrans R-Value	CFLHD R-Value	Kleinfelder R-Value
35.95	6.75					
36.27			6.00			30
36.45	7.00					
36.73			8.00			17
36.95	9.00					
37.22			48.00			69
37.39		8.00				
37.42		9.60			15	
37.45	9.50					
37.64		6.00				
37.67		6.00				
37.83			12.00			63
37.95	9.00					
38.13			off alignment			7
38.45	7.00					
38.87		12.00			18	
38.90				39		
38.95	6.00					
39.00				14		
39.10				13		
39.13			7.00			14
39.26		6.00				
39.28		6.00				
39.36		9.60				
39.44		24.00				
39.45	13.50					
39.50				15		
39.71			6.00			14
39.95	10.00					
40.39				13		
40.45	6.75					

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLDT COUNTY

Average of HACP from the 3 sources but excluding the 48 inches HACP core = 8.78 inches.

Average of R-Values from the 3 sources but excluding the two highest R-Values = 17. The two highest R-Values are in slide areas and have very thick pavement.

V. PAVEMENT RECOMMENDATIONS AND DISCUSSION

CFLHD follows AASHTO design processes and use the 1993 AASHTO DARWin pavement design software. CFLHD Project Development Design Manual (PDDM) recommended values and inputs were used.

Caltrans' Office of Travel Forecasting and Modeling in a memorandum dated 9/24/2013 provided the Traffic Index (TI) and design 20-year Equivalent Single Axle Loads (ESAL). TI was 8.5 and ESALs were 618,600.

In consultation with Caltrans District 1 Materials Engineer, Wesley Johnson P.E., a preliminary subgrade design R-Value of 15 was selected for pavement design. The Kleinfelder field work validated the preliminary design value. Mr. Johnson, in consultation with Caltrans headquarters performed a pavement design using the new CalME software. The CalME design concurs with the CFLHD AASHTO DARWin pavement structural section recommendation:

California State Route 36:

MP 36.0 to MP 39.9

Re-construction:
6 inches HACP
9 inches Aggregate Base Course

In addition, Caltrans provided the following pavement structural section designs for temporary detours. CFLHD concurs with these recommendations.

Temporary 6 month detour (in permanent alignment):

3.5 inches HACP
9 inches Aggregate Base Course

Temporary 6 month detour (outside permanent alignment):

3.5 inches HACP
6 inches Aggregate Base Course

Recycling Option

The existing pavement can be milled or pulverized and used as aggregate base course provided it meets the requirements of Subsection 303.08 and the following gradation per AASHTO T27 test procedure.

Table 2: SCR 303.08 Gradation Requirements

Sieve Designation	Percent Passing
1 ½ inch	100
1 inch	85 - 100

Material Recommendation for Culvert Pipe Type

The following table summarizes soil samples collected by Kleinfelder and tested for corrosive properties.

Table 3: Summary of Corrosive Tests

Sample #	Resistivity	pH	Sulfate %	Sulfate ppm	Chloride %	Chloride ppm	Corrosion Rating
P-1	1530	7.2	0.22	220	0.0013	13	CR-3
P-2	1720	7.4	0.004	40	0.0015	15	CR-3
P-3	3850	7.3	0.007	70	0.0014	14	CR-1
P-5	2720	6.6	0.004	40	0.0028	28	CR-1
SI-09	560	5.6	0.333	3330	0.0017	17	CR-3
TP combined Samples	2790	5.4	0.004	40	0.0004	4	CR-1

Samples P-1, P-2, and SI-09 are corrosive. Due to the high variability of the soils within the project length the recommended pipe types for the project are aluminized steel, aluminum alloy, and plastic pipe.

Recommended Bid Items

Material recommendations are based on current 2014 pay items.

- **30101-0000 Aggregate Base** if total project quantities exceed 5000 tons. Estimate at 139 lb/ft³.
- **30305-2000 Pulverizing 4-inch Depth** and **30305-3000 Pulverizing 6-inch Depth**, paid by the station. The unit weight can be estimated at 141 lb/ft³.
- **30802-2000 Roadway Aggregate, Method 2** for total project quantities that are 5000 tons or less. Estimate at 139 lb/ft³. Pavement millings from the job site or pulverized material from the job site that meet the requirements of subsection 303.08 may be used in lieu of imported aggregate base course.
- **40101-5600 Superpave Pavement, 1/2 –inch or ¾-inch Nominal Maximum Aggregate, 0.3 to <3 Million ESALs** if total project quantities exceed 4000 tons. Estimate at 145.2 lb/ft³. Asphalt Cement will be PG 64-28PM per Caltrans District 1 recommendation for this location. Specify Type III Pavement Roughness in the SCR. A Materials Transfer Vehicle (MTV) is specified in the SCR.
- **40301-0000 Hot Asphalt Concrete Pavement** for total project quantities that are 4000 tons or less. Estimate at 145.2 lb/ft³.
- **40105-3000 Antistrip Additive, Type 3** is required for item 40101-5600. Estimate at 1% by weight of mix. CFLHD does not allow the use of liquid antistrip. For item 40301-0000, antistrip is required but is subsidiary to the pay item.
- **40920-1000 Fog Seal, Emulsified Asphalt Grade CSS-1, CSS-1h, SS-1, or SS-1h.** A fog seal is placed on the HACP to reduce aging from the heat of the hot plant. Estimate at 0.10 gal/yd².
- **41201-1000 Tack Coat Grade CSS-1, CSS-1h, SS-1, SS-1h.** HACP shall be placed in two lifts with a required tack coat between lifts. Estimate at 0.10 gal/yd².
- **41101-000 Prime Coat.** Apply a prime coat to the aggregate base course prior to paving. Estimate at 0.27 gal/yd².
- **41105-0000 Blotter.** Include this blotter control item. Estimate at 14.75 lb/ft².

APPENDICES

A – Location Map

B – Laboratory Test Results

C – Photographs

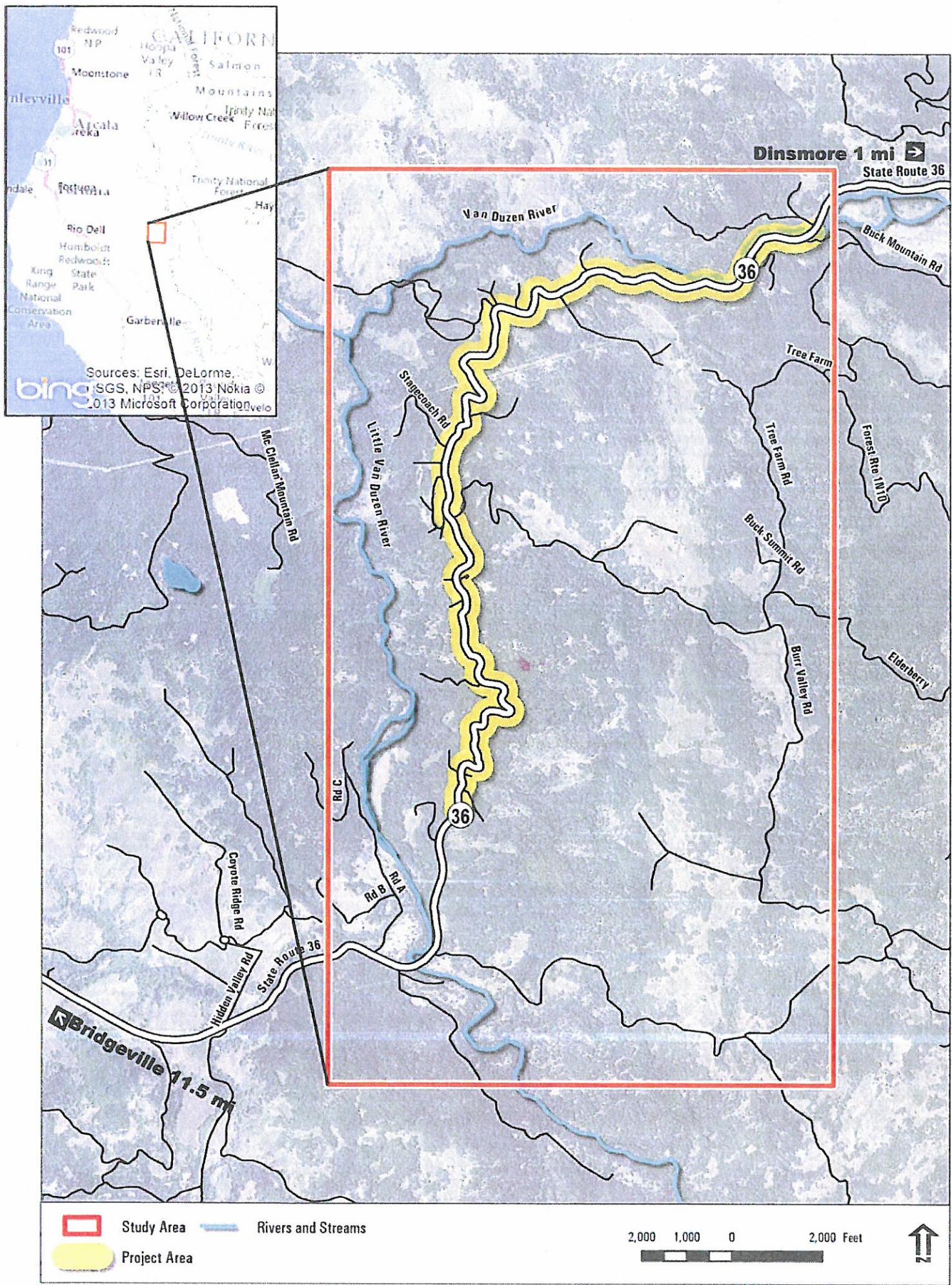
D – Pavement Design Calculations

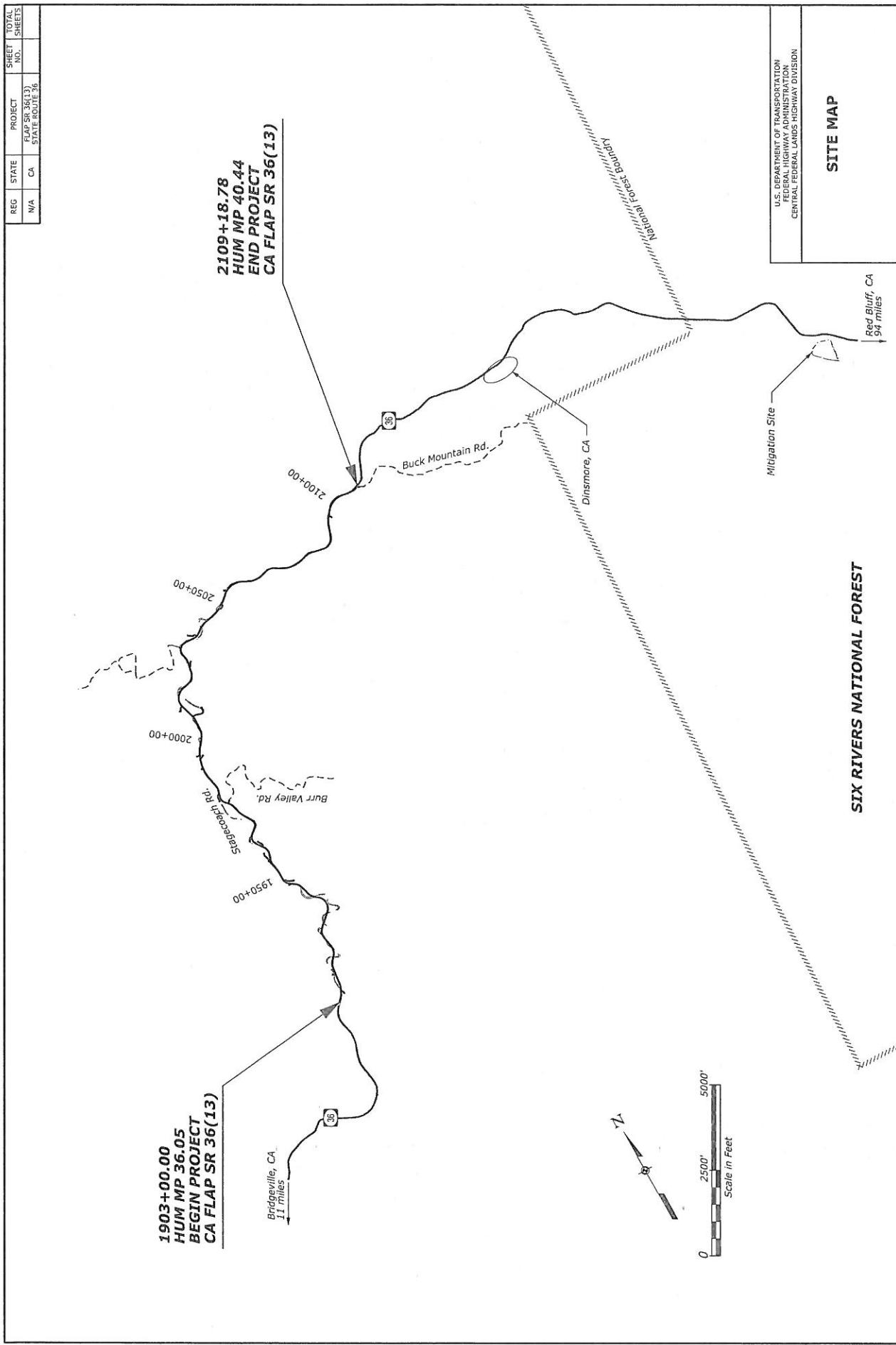
E – Traffic Data

F – Field Data Summary

APPENDIX A

LOCATION MAP





User: Kelly Terrell

10-13-27 AM N:\CALIS\36(13)\Roadway\Supp\G:\wave\material\104\05 site map.dgn

SIX RIVERS NATIONAL FOREST

SITE MAP

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

APPENDIX B

LABORATORY TEST RESULTS

CO.	ROUTE	PM	MATERIAL	DATE	EA	R VALUE	PH	Ω VALUE	LAB#	INFO.	NOTE :
Hum	36	35.53	Basement Soil			Begn MP 36.00	5.30	6200		corrosion box	
Hum	36	36.47	Basement Soil	Jul-97	01-267821		5.56	7337	51901		
Hum	36	36.94	Basement Soil	Apr-93	01-299001		6.40	3602	49993		
Hum	36	36.94	Water	Apr-93	01-299001		7.70	5803	49993		
Hum	36	37.00	Basement Soil	Apr-93	01-299001		5.80	11339	49993		
Hum	36	37.08	Basement Soil			MP 37.08 R=	6.00	6200		corrosion box	
Hum	36	38.44	Basement Soil				6.30	7337			
Hum	36	38.44	Water				7.60	4802			
Hum	36	38.49	Basement Soil	Feb-01	01-422700		9.53	1134	53657		
Hum	36	38.67	Basement Soil				5.90	7450		corrosion box	
Hum	36	38.85	Basement Soil				6.30	5580		corrosion box	
Hum	36	38.85	Water			MP 38.85 R=10	7.70	6200		corrosion box	
Hum	36	38.90	Basement Soil	Dec-92	01-314300	39	6.60	4536	49910	Sta 15+10, Rt.	
Hum	36	38.97	Basement Soil				6.10	3468			
Hum	36	38.97	Water				7.90	4135			
Hum	36	39.00	Basement Soil	Dec-93	01-314300	14	7.40	2468	50463	Culvert	
Hum	36	39.00	Basement Soil				6.20	3750		corrosion box	
Hum	36	39.00	Basement Soil				6.70	5069			
Hum	36	39.00	Water				7.10	4950		corrosion box	
Hum	36	39.00	Water				7.60	4268			
Hum	36	39.10	Basement Soil	Dec-92	01-314300	13	6.80	5703	49909		
Hum	36	39.30	Basement Soil	Feb-01	01-422700		7.46	3669	53658		
Hum	36	39.36	Basement Soil	Apr-07	01-475501		6.39	2600	57203		
Hum	36	39.44	Basement Soil				6.90	5400		corrosion box	
Hum	36	39.44	Water				7.40	4350		corrosion box	
Hum	36	39.47	Basement Soil				6.90	1850		corrosion box	
Hum	36	39.50	Basement Soil	Apr-07	01-475501	15	6.28	2100	57204		
Hum	36	39.61	Basement Soil				6.80	5580		corrosion box	
Hum	36	39.78	Basement Soil				6.30	2100		corrosion box	
Hum	36	39.82	Basement Soil				6.10	2100		corrosion box	
Hum	36	40.00	Basement Soil				6.60	3300			
Hum	36	40.00	Water				6.80	12000			
Hum	36	40.24	Basement Soil				6.10	6200		corrosion box	
Hum	36	40.24	Water				6.40	5580		corrosion box	
Hum	36	40.31	Basement Soil				6.20	5550		corrosion box	
Hum	36	40.39	Basement Soil	Apr-07	01-475501	13	6.32	1800	57205		
Hum	36	40.45	Basement Soil			End MP 40.40	5.50	6200		corrosion box	
Hum	36	40.83	Basement Soil				6.30	7400		corrosion box	

clay <5000



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 1 of 6

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Submitted By: Braden Peters

Date Reported: 5/7/2013

Sample Number	Lab Number	13-203-SB	13-204-SB	13-205-SB	13-206-SB	13-207-SB
	Boring Number	SI-6	SI-6	SI-6	SI-6	P-8
	Field Number	SPT 1, 2, 3	SPT 4, 5, 6	SPT 7, 8, 9	SPT 10	SPT 1 & 2

Sample Location	Milepost	Not Furnished				
	Depth Feet	50-61.5	70-81.5	85-96.5	100-101.5	5-11.5

AASHTO T 11, T 27 & T 88	3"	75.0 mm				
	1 1/2"	37.5 mm	100		100	100
	1"	25.0 mm	94	100	97	96
	3/4"	19.0 mm	94	96	96	94
	1/2"	12.5 mm	89	92	94	94
	3/8"	9.5 mm	87	88	89	90
	#4	4.75 mm	81	78	80	83
	#8	2.36 mm				
	#10	2.00 mm	73	63	69	69
	#16	1.18 mm	67	55	62	63
	#30	600 µm				
	#40	425 µm	58	44	50	49
	#50	300 µm				
	#100	150 µm	49	36	40	36
	#200	75 µm	43	30	33	29
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %					
	Dry Density, pcf					
AASHTO T 89 & T 90	Liquid Limit	30	21	27	*	*
	Plasticity Index	17	7	15	*	*
Soil Classification	AASHTO M 145	A-6 (3)	A-2-4 (0)	A-2-6 (1)	*	*
	ASTM D 2487	SC	SC-SM	SC	*	*
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution:
Laboratory
Pavements
Geotechnical
Materials

Num. / Project File
Darrell Harding
Steve Deppmeier
Braden Peters
Mike Peabody

Remarks: A report of specialty tests will follow at a later date.

* Not enough material was furnished to perform plasticity testing or soil classification.

Reported By:

Darrell Harding
Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



Report of Soil or Aggregate Tests

Page 2 of 6

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Submitted By: Braden Peters

Date Reported: 5/7/2013

Sample Number	Lab Number	13-208-SB	13-209-SB	13-210-SB	13-214-SB	13-215-SB
Boring Number	P-8	P-8	P-8	P-9	P-9	
Field Number	SPT 3 & 4	SPT 5	SPT 6, 7, 8	SPT 1 & 2	SPT 3 & 4	
Sample Location	Milepost	Not Furnished	Not Furnished	Not Furnished	39.44	39.44
	Depth	Feet	20-26.5	30-31.5	40-51.5	5-11.5
AASHTO T 11, T 27 & T 88	3"	75.0 mm				
	1 1/2"	37.5 mm				
	1"	25.0 mm		100	100	
	3/4"	19.0 mm		98	97	
	1/2"	12.5 mm	100	97	93	100
	3/8"	9.5 mm	98	94	89	98
	#4	4.75 mm	88	84	81	96
	#8	2.36 mm				
	#10	2.00 mm	72	69	68	91
	#16	1.18 mm	64	61	61	88
	#30	600 µm				
	#40	425 µm	52	49	48	82
	#50	300 µm				
	#100	150 µm	43	39	37	76
	#200	75 µm	37	34	31	72
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %					
	Dry Density, pcf					
AASHTO T 89 & T 90	Liquid Limit	29		24	28	52
	Plasticity Index	14		9	12	37
Soil Classification	AASHTO M 145	A-6 (1)		A-2-4 (0)	A-2-6 (0)	A-7-6 (25)
	ASTM D 2487	SC		SC	SC	CH
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution: Num. / Project File
 Laboratory Darrell Harding
 Pavements Steve Deppmeier
 Geotechnical Braden Peters
 Materials Mike Peabody

Remarks: No laboratory testing was requested for field number SPT 5.

Reported By:

 Darrell Harding
Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 3 of 6

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Submitted By: Braden Peters

Date Reported: 5/7/2013

	Lab Number	13-218-SB	13-219-SB	13-220-SB	13-221-SB	13-222-SB
Sample Number	Boring Number	P-9	P-9	SI-9	SI-9	SI-9
	Field Number	SPT 5 & 6	SPT 8, 9, 10	SPT 01	SPT 02 & 03	SPT 04 & 05
Sample Location	Milepost	39.44	Not Furnished	Not Furnished	Not Furnished	39.44
	Depth Feet	30-36.5	40-51.5	56.7-58.2	61.7-63.1 & 66.7-68.2	71.7-73.2 & 76.7-78.2
AASHTO T 11, T 27 & T 88	3"	75.0 mm				
	1 1/2"	37.5 mm				100
	1"	25.0 mm	100	100		98
	3/4"	19.0 mm	98	99	100	98
	1/2"	12.5 mm	96	94	99	98
	3/8"	9.5 mm	95	93	99	96
	#4	4.75 mm	89	82	94	91
	#8	2.36 mm				
	#10	2.00 mm	81	73	88	83
	#16	1.18 mm	76	68	84	77
	#30	600 µm				
	#40	425 µm	67	60	77	68
	#50	300 µm				
	#100	150 µm	59	52	70	60
	#200	75 µm	54	47	66	55
Washed Sieve Analysis % Passing		20 µm				
		2 µm				
AASHTO T 255	Moisture, %					
	Dry Density, pcf					
AASHTO T 89 & T 90	Liquid Limit	29	30	43	28	30
	Plasticity Index	14	18	30	13	15
Soil Classification	AASHTO M 145	A-6 (4)	A-6 (4)	A-7-6 (17)	A-6 (4)	A-6 (5)
	ASTM D 2487	CL	SC	CL	CL	CL
AASHTO T 190	R - Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution: Num. / Project File

Laboratory Darrell Harding

Pavements Steve Deppmeier

Geotechnical Braden Peters

Materials Mike Peabody

Remarks:

Reported By:

Darrell Harding
Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 4 of 6

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Submitted By: Braden Peters

Date Reported: 5/7/2013

Sample Number	Lab Number	13-223-SB	13-226-S	13-227-SB	13-228-SB	
	Boring Number	SI-9	SI-09	SI-10	SI-10	
	Field Number	SPT 06 & 07	Bulk	SPT 1, 2, 3	SPT 4	
Sample Location	Milepost	Not Furnished	Not Furnished	Not Furnished	Not Furnished	
	Depth Feet	81.7-83.2 & 86.7-88.2	20-22	10-31.5	40-41.5	
AASHTO T 11, T 27 & T 88 Washed Sieve Analysis % Passing	3"	75.0 mm				
	1 1/2"	37.5 mm			100	
	1"	25.0 mm	100		97	
	3/4"	19.0 mm	99	100	97	
	1/2"	12.5 mm	97	99	95	100
	3/8"	9.5 mm	95	98	93	99
	#4	4.75 mm	90	94	85	91
	#8	2.36 mm				
	#10	2.00 mm	83	90	76	83
	#16	1.18 mm	79	87	71	78
	#30	600 µm				
	#40	425 µm	70	81	63	70
	#50	300 µm				
	#100	150 µm	61	74	55	62
	#200	75 µm	55	68	50	57
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %					
	Dry Density, pcf					
AASHTO T 89 & T 90	Liquid Limit	33	45	29	35	
	Plasticity Index	20	31	17	21	
Soil Classification	AASHTO M 145	A-6 (7)	A-7-6 (19)	A-6 (4)	A-6 (8)	
	ASTM D 2487	CL	CL	CL	CL	
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm		560			
AASHTO T 289	pH		5.6			
AASHTO T 290	Sulfate Content, % / ppm		0.333 / 3330			
AASHTO T 291	Chloride Content, % / ppm		0.0017 / 17			

Distribution: Num. / Project File
 Laboratory Darrell Harding
 Pavements Steve Deppmeyer
 Geotechnical Braden Peters
 Materials Mike Peabody

Remarks:

Sulfate & chloride content testing was performed by FHWA consultant, Colorado Analytical Laboratories.

Reported By:

Darrell Harding
Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



Report of Rock Core Tests

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Page 5 of 6

Laboratory Numbers: See Below

Date Reported: 5/7/2013

Submitted By: Braden Peters

Material Type: Rock Cores

Material Source: Bore Holes

Tested For: Unconfined Compressive Strength

Field Boring Numbers: See Below

Test Results

Laboratory Number	Boring Number	Sample Depth (feet)	Specimen Length (inches)	Specimen Diameter (inches)	L/D Ratio	Total Load (lbf)	Compressive Strength (psi)
13-225-C	SI-09	148.5	5.41	2.40	2.25	61,189	13,530
13-229-C	SI-10	54-55	5.81	2.39	2.43	87,961	19,610

During rock core trimming two of the specimens, SI-09 @ 134' and SI-10 @ 145' broke. Both appeared to break along existing planes.

Distribution:
Laboratory
Pavements
Geotechnical
Materials

Num. / Project File
Darrell Harding
Steve Deppmeier
Braden Peters
Mike Peabody

Reported By:



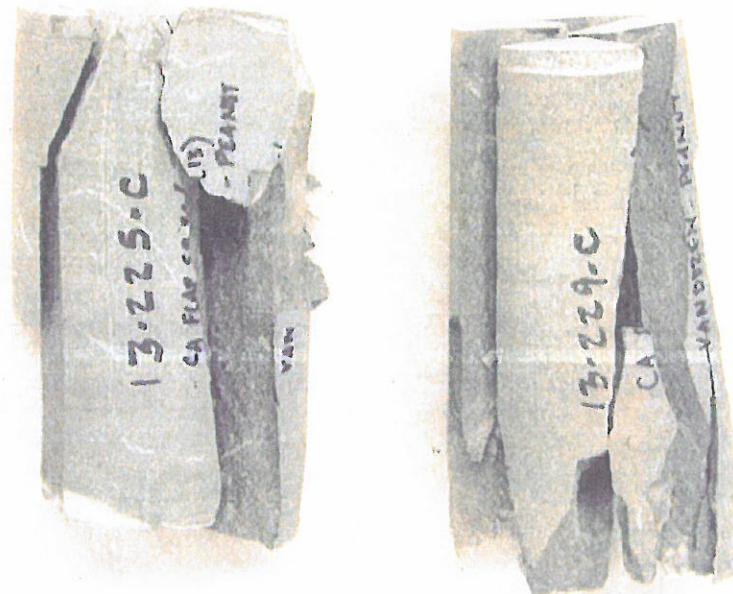
Darrell Harding

0" 1" 2" 3" 4" 5" 6"



Trimmed Compressive Strength Samples

0" 1" 2" 3" 4" 5" 6"



Tested Compressive Strength Samples



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Page 1 of 8

Submitted By: Braden Peters

Date Revised: 4/25/2013

Date Reported: 4/11/2013

Sample Number	Lab Number	13-139-SB	13-140-SB	13-141-SB	13-144-S	13-145-T
	Boring Number	SI-1	SI-1	SI-1	P-1	P-1
	Field Number	CSPT-1	SPT-2	CSPT-3	Bulk Sample	CSPT-3
Sample Location	Station or Location					
	Depth Feet	5-6.5	10	15	17-22	36-36.5
AASHTO T 11, T 27 & T 88	3"	75.0 mm	100			
	1 1/2"	37.5 mm	94	100		
	1"	25.0 mm	86	85		
	3/4"	19.0 mm	84	85	100	100
	1/2"	12.5 mm	80	84	99	99
	3/8"	9.5 mm	77	82	98	98
	#4	4.75 mm	68	76	96	95
	#8	2.36 mm				87
	#10	2.00 mm	55	67	89	71
	#16	1.18 mm	48	61	84	85
	#30	600 µm				
	#40	425 µm	38	53	77	79
	#50	300 µm				
	#100	150 µm	31	45	66	68
	#200	75 µm	27	38	57	58
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %					19.1
	Dry Density, pcf					112.5
AASHTO T 89 & T 90	Liquid Limit	28	*	34	36	26
	Plasticity Index	12	*	16	18	9
Soil Classification	AASHTO M 145	A-2-6 (0)	*	A-6 (6)	A-6 (8)	A-4 (0)
	ASTM D 2487	SC	*	CL	CL	SC
AASHTO T 190	R - Value					
AASHTO T 288	Min. Resistivity, ohm x cm					1530
AASHTO T 289	pH					7.3
AASHTO T 290	Sulfate Content, % / ppm					0.022 / 220
AASHTO T 291	Chloride Content, % / ppm					0.0013 / 13

Distribution: Num / Project File
 Laboratory: Darrell Harding
 Geotechnical: Braden Peters
 Materials: Mike Peabody

Remarks: A report of specialty tests will follow at a later date.

Sulfate & chloride content testing was performed by FHWA consultant, Colorado Analytical Laboratories.

* Not enough material was furnished to perform plasticity testing or soil classification.

The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 2 of 8

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Date Revised: 4/25/2013

Submitted By: Braden Peters

Date Reported: 4/11/2013

Sample Number	Lab Number	13-146-SB	13-148-RV	13-149-S	13-150-SB	13-151-SB
Sample Location	Boring Number	SI-2	P2	P-3	SI-3	SI-3
	Field Number	SPT-02 & 03	Bulk	Bulk	SPT-01	SPT-02
AASHTO T 11, T 27 & T 88	3"	75.0 mm				
	1 1/2"	37.5 mm			100	
	1"	25.0 mm			90	100
	3/4"	19.0 mm			88	98
	1/2"	12.5 mm	100	100	81	95
	3/8"	9.5 mm	97	99	75	91
	#4	4.75 mm	86	94	60	82
	#8	2.36 mm				
	#10	2.00 mm	70	84	42	69
	#16	1.18 mm	62	78	34	62
	#30	600 µm				
	#40	425 µm	50	66	21	50
	#50	300 µm				
	#100	150 µm	40	55	11	40
	#200	75 µm	32	48	7.3	33
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %	13.6				11.8
	Dry Density, pcf					
AASHTO T 89 & T 90	Liquid Limit	22	36		NV	27
	Plasticity Index	7	18		NP	12
Soil Classification	AASHTO M 145	A-2-4 (0)	A-6 (5)		A-1-a (0)	A-2-6 (0)
	ASTM D 2487	SC-SM	SC		SW-SM	SC
AASHTO T 190	R – Value		15			
AASHTO T 288	Min. Resistivity, ohm x cm		1720	3850		
AASHTO T 289	pH		7.4	7.3		
AASHTO T 290	Sulfate Content, % / ppm		0.004 / 40	0.007 / 70		
AASHTO T 291	Chloride Content, % / ppm		0.0015 / 15	0.0014 / 14		

Distribution: Num. / Project File
 Laboratory: Darrell Harding
 Geotechnical: Braden Peters
 Materials: Mike Peabody

Remarks: Sulfate & chloride content testing was performed by FHWA consultant, Colorado Analytical Laboratories.

pH, resistivity, sulfate content and chloride content were the only tests requested for Lab Number 13-149-S.

The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 3 of 8

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Date Revised: 4/25/2013

Submitted By: Braden Peters

Date Reported: 4/11/2013

Sample Number	Lab Number	13-152-T	13-153-T	13-154-SB	13-155-SB	13-156-T
	Boring Number	SI-3	SI-3	SI-3	SI-4	SI-4
	Field Number	CA 01A	CA 03A	SPT-11, 12 & 13	SPT-01 CA-01 B & 02 B	CA-01A
Sample Location	Station or Location					
	Depth Feet	15	55	70-81.5	5-16.5	10
AASHTO T 11, T 27 & T 88	3"	75.0 mm				
	1 1/2"	37.5 mm		100	100	
	1"	25.0 mm	100	89	87	
	3/4"	19.0 mm	97	86	85	100
	1/2"	12.5 mm	95	80	80	99
	3/8"	9.5 mm	93	78	76	95
	#4	4.75 mm	86	72	69	81
	#8	2.36 mm				
	#10	2.00 mm	74	63	57	62
	#16	1.18 mm	67	56	50	54
	#30	600 µm				
	#40	425 µm	55	46	37	42
	#50	300 µm				
	#100	150 µm	44	36	28	33
	#200	75 µm	37	30	23	28
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %	14.1	13.8			13.6
	Dry Density, pcf	123.2	115.1			116.9
AASHTO T 89 & T 90	Liquid Limit	31	28	21	30	
	Plasticity Index	14	12	8	11	
Soil Classification	AASHTO M 145	A-6 (1)	A-2-6 (0)	A-2-4 (0)	A-2-6 (0)	
	ASTM D 2487	SC	SC	SC	SC	
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution:
Laboratory
Geotechnical
Materials

Num. / Project File
Darrell Harding
Braden Peters
Mike Peabody

Remarks: Moisture content and dry unit weight were the only tests requested for Lab Number 13-156-T.
The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
Laboratory Manager



US Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 4 of 8

Project: California FLAP SR 36 (13) Van Duzen – Peanut

Date Revised: 4/25/2013

Submitted By: Braden Peters

Date Reported: 4/11/2013

Sample Number	Lab Number	13-157-T	13-158-T	13-159-T	13-160-SB	13-161-SB
	Boring Number	SI-4	SI-4	SI-4	SI-4	P-5
	Field Number	CA-03A	CA-04A	CA-05A	SPT-07	SPT1
Sample Location	Station or Location					
	Depth Feet	25	31-31.5	51-51.5	60-61.5	5-6.5
AASHTO T 11, T 27 & T 88	3"	75.0 mm	100			
	1 1/2"	37.5 mm	92	100		
	1"	25.0 mm	85	96	95	100
	3/4"	19.0 mm	82	87	90	96
	1/2"	12.5 mm	73	67	86	99
	3/8"	9.5 mm	69	64	83	96
	#4	4.75 mm	57	54	71	77
	#8	2.36 mm				
	#10	2.00 mm	41	45	60	56
	#16	1.18 mm	33	40	54	45
	#30	600 µm				
	#40	425 µm	22	31	42	30
	#50	300 µm				
	#100	150 µm	14	24	33	20
	#200	75 µm	11	20	27	16
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %	4.3	12.7	8.9		
	Dry Density, pcf	138.1	116.5	133.3		
AASHTO T 89 & T 90	Liquid Limit	16	27	19	18	
	Plasticity Index	3	14	7	6	
Soil Classification	AASHTO M 145	A-1-a (0)	A-2-6 (0)	A-2-4 (0)	A-1-b (0)	
	ASTM D 2487	SP-SM	GC	SC-SM	SC-SM	
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution: Num. / Project File
 Laboratory Darrell Harding
 Geotechnical Braden Peters
 Materials Mike Peabody

Remarks: The washed sieve analysis was the only test requested for Lab Number 13-161-SB.

The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
 Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 5 of 8

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Date Revised: 4/25/2013

Submitted By: Braden Peters

Date Reported: 4/11/2013

Sample Number	Lab Number	13-164-SB	13-165-RV	13-166-SB	13-167-SB	13-(168 & 169)-T
	Boring Number	P-5	P-5	P-6	P-6	P-6
	Field Number	SPT 4 & SPT 5	Bulk	SPT-1	SPT-2	CSPT-1A & CSPT-1B
Sample Location	Station or Location					
	Depth Feet	25-31.5	10-13	5-5.75	10-11.5	15.5-16.5
AASHTO T 11, T 27 & T 88	3"	75.0 mm				100
	1 1/2"	37.5 mm				79
	1"	25.0 mm	100		100	79
	3/4"	19.0 mm	96	100	96	99
	1/2"	12.5 mm	95	99	89	97
	3/8"	9.5 mm	94	96	79	93
	#4	4.75 mm	89	85	57	85
	#8	2.36 mm				
	#10	2.00 mm	80	72	39	73
	#16	1.18 mm	73	65	31	67
	#30	600 µm				
	#40	425 µm	54	52	17	56
	#50	300 µm				
	#100	150 µm	35	42	8	47
	#200	75 µm	27	38	5.2	41
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %					7.5
	Dry Density, pcf					
AASHTO T 89 & T 90	Liquid Limit	22	32		33	25
	Plasticity Index	8	15		15	11
Soil Classification	AASHTO M 145	A-2-4 (0)	A-6 (2)		A-6 (2)	A-2-6 (0)
	ASTM D 2487	SC	SC		SC	GC
AASHTO T 190	R - Value		18			
AASHTO T 288	Min. Resistivity, ohm x cm		2720			
AASHTO T 289	pH		6.6			
AASHTO T 290	Sulfate Content, % / ppm		0.004 / 40			
AASHTO T 291	Chloride Content, % / ppm		0.0028 / 28			

Distribution:
Laboratory
Geotechnical
Materials

Num. / Project File
Darrell Harding
Braden Peters
Mike Peabody

Remarks: Sulfate & chloride content testing was performed by FHWA consultant, Colorado Analytical Laboratories.

The washed sieve analysis was the only test requested for Lab Number 13-166-SB.

The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
Laboratory Manager



U.S. Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 6 of 8

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Date Revised: 4/25/2013

Submitted By: Braden Peters

Date Reported: 4/11/2013

Sample Number	Lab Number	13-170-SB	13-171-SB	13-172-T	13-173-SB	13-174-SB
	Boring Number	P-6	P-6	P-6	P-7	P-7
	Field Number	SPT-5	SPT-7	CSPT-2A	SPT 1 to 5	SPT 6 to 8
Sample Location	Station or Location					
	Depth	Feet	30-31.5	40-41.5	45.5-46	4-25
AASHTO T 11, T 27 & T 88	3"	75.0 mm				
	1 1/2"	37.5 mm		100	100	100
	1"	25.0 mm		87	95	78
	3/4"	19.0 mm	100	87	89	69
	1/2"	12.5 mm	99	83	79	61
	3/8"	9.5 mm	93	82	75	54
	#4	4.75 mm	72	73	66	43
	#8	2.36 mm				
	#10	2.00 mm	56	62	54	35
	#16	1.18 mm	49	56	48	31
	#30	600 µm				
	#40	425 µm	40	45	39	26
	#50	300 µm				
	#100	150 µm	33	26	32	19
	#200	75 µm	27	30	28	14
Washed Sieve Analysis % Passing		20 µm				
		2 µm				
AASHTO T 255	Moisture, %			8.2		
	Dry Density, pcf			122.3		
AASHTO T 89 & T 90	Liquid Limit	*	30	23	31	23
	Plasticity Index	*	16	10	14	7
Soil Classification	AASHTO M 145	*	A-6 (5)	A-2-4 (0)	A-2-6 (1)	A-2-4 (0)
	ASTM D 2487	*	CL	SC	SC	GC-GM
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution: Num. / Project File
 Laboratory Darrell Harding
 Geotechnical Braden Peters
 Materials Mike Peabody

Remarks: * Not enough material was furnished to perform plasticity testing or soil classification.

The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
Laboratory Manager



US Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 7 of 8

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Date Revised: 4/25/2013

Submitted By: Braden Peters

Date Reported: 4/11/2013

Sample Number	Lab Number	13-175-SB	13-176-T	13-177-SB	13-178-SB	13-179-SB
Sample Location	Station or Location					
	Depth	Feet	49-50.5	55-56.5	55-56.5	60-71.5
	3"	75.0 mm				
	1 1/2"	37.5 mm			100	100
	1"	25.0 mm	100		87	98
	3/4"	19.0 mm	99		87	97
	1/2"	12.5 mm	93		80	93
	3/8"	9.5 mm	92		78	90
	#4	4.75 mm	82		68	81
	#8	2.36 mm				
	#10	2.00 mm	71		62	69
	#16	1.18 mm	65		58	63
	#30	600 µm				
	#40	425 µm	55		51	53
	#50	300 µm				
	#100	150 µm	46		43	43
	#200	75 µm	41		37	37
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %		14.0			
	Dry Density, pcf		124.4			
AASHTO T 89 & T 90	Liquid Limit	28		34	28	27
	Plasticity Index	14		18	13	12
Soil Classification	AASHTO M 145	A-6 (2)		A-6 (2)	A-6 (1)	A-6 (1)
	ASTM D 2487	SC		GC	SC	SC
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution:
Laboratory
Geotechnical
Materials

Num. / Project File
Darrell Harding
Braden Peters
Mike Peabody

Remarks: The moisture content and dry density determination were the only tests requested for Lab Number 13-176-T.

The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
Laboratory Manager



US Department
of Transportation
Federal Highway
Administration

Central Federal Lands Highway Division Laboratory

An AASHTO and ISO Accredited Laboratory



AASHTO R18 ISO/IEC 17025

Report of Soil or Aggregate Tests

Page 8 of 8

Project: California FLAP SR 36 (13) Van Duzen - Peanut

Submitted By: Braden Peters

Date Revised: 4/25/2013

Date Reported: 4/11/2013

Sample Number	Lab Number	13-180-SB				
	Boring Number	SI-7				
	Field Number	SPT 9-11				
Sample Location	Station or Location					
	Depth Feet	90-101.5				
AASHTO T 11, T 27 & T 88	3"	75.0 mm				
	1 1/2"	37.5 mm				
	1"	25.0 mm	100			
	3/4"	19.0 mm	95			
	1/2"	12.5 mm	93			
	3/8"	9.5 mm	92			
	#4	4.75 mm	85			
	#8	2.36 mm				
Washed Sieve Analysis % Passing	#10	2.00 mm	66			
	#16	1.18 mm	55			
	#30	600 µm				
	#40	425 µm	39			
	#50	300 µm				
	#100	150 µm	28			
	#200	75 µm	22			
		20 µm				
		2 µm				
AASHTO T 255	Moisture, %					
	Dry Density, pcf					
AASHTO T 89 & T 90	Liquid Limit	19				
	Plasticity Index	6				
Soil Classification	AASHTO M 145	A-1-b (0)				
	ASTM D 2487	SC-SM				
AASHTO T 190	R – Value					
AASHTO T 288	Min. Resistivity, ohm x cm					
AASHTO T 289	pH					
AASHTO T 290	Sulfate Content, % / ppm					
AASHTO T 291	Chloride Content, % / ppm					

Distribution: Num. / Project File

Laboratory Darrell Harding

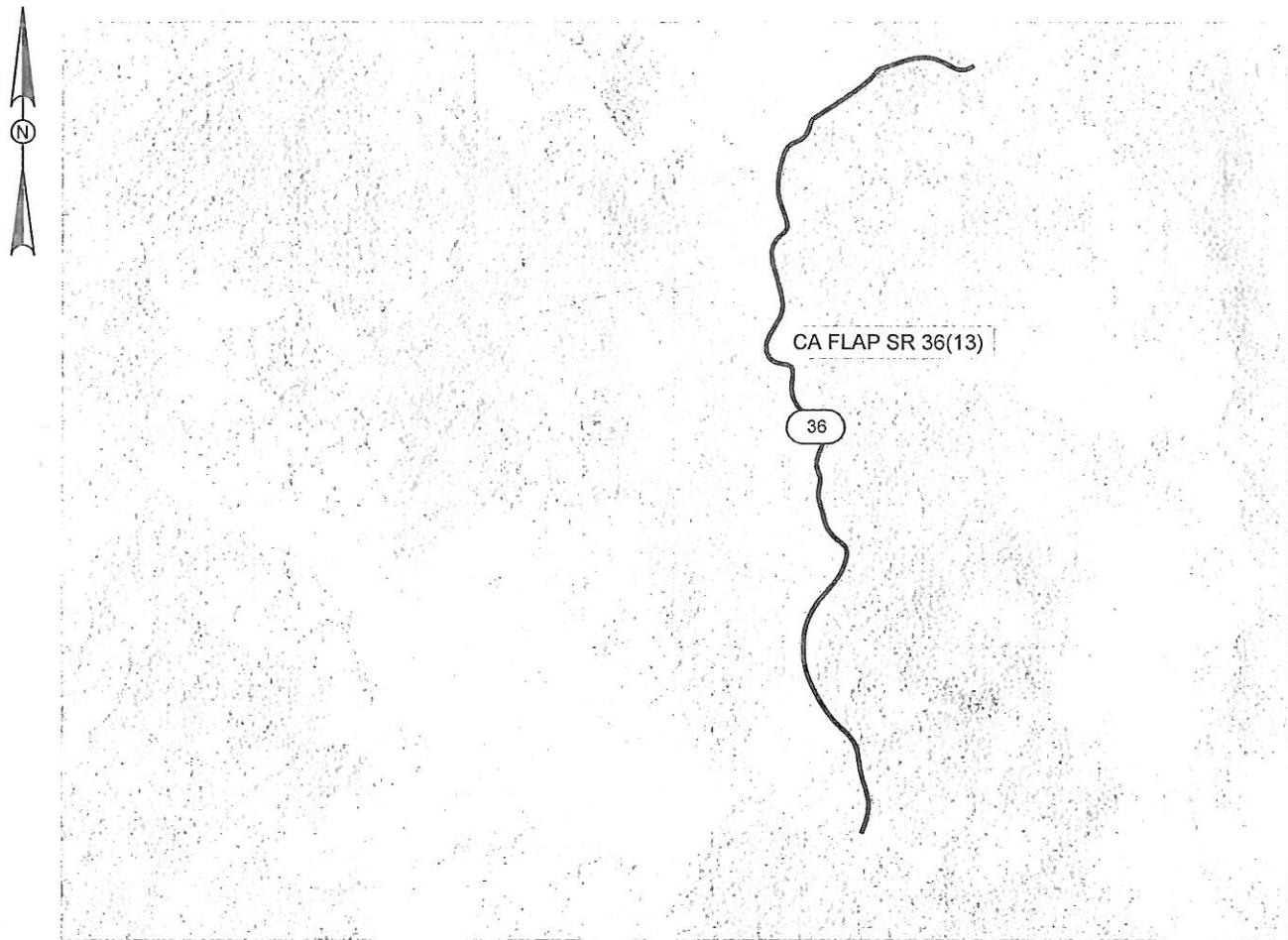
Geotechnical Braden Peters

Materials Mike Peabody

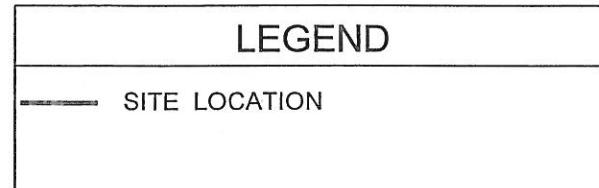
Remarks: The report was revised at Braden Peter's request. The revisions are highlighted in red.

Reported By:

Darrell Harding
Laboratory Manager

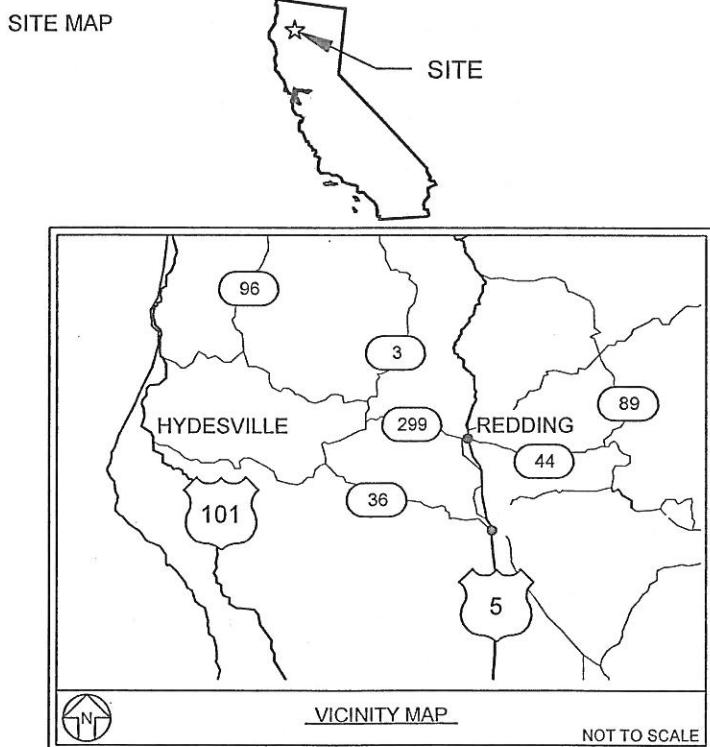


0 10000 20000
SCALE: 1" = 10000' SCALE IN FEET

NOTES:

1. BASE MAPPING CREATED FROM USGS THE NATIONAL MAP VIEWER DATE CREATED 11/20/13

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



PROJECT NO.	136595	SITE and	PLATE
DRAWN BY:	PAF	VICINITY MAP	
CHECKED BY:	NF	State Road 36 Humboldt County	
DATE:	11-19-13	CA FLAP SR36(13)	
REVISED:	-	Federal Highway Administration	
		Central Federal Lands Highway Division	
		Humboldt County, California	

Exploration ID	Aprox. Sample Depth (ft.)	Sample No.	Sample Description	Moisture Content (%)	Dry Density (pcf)	Passing 3/4 inch Sieve (%)	Passing #4 Sieve (%)	Passing #200 Sieve (%)	Sieve Analysis		Atterberg Limits		Other Tests	
									LL	PL	P _I	NV	NP	NP
B-101	5.5		SILTY GRAVEL WITH SAND (SM)	7		77	43	14						
B-101	6.0			7										
B-102	6.0		CLAYEY GRAVEL WITH SAND (GC)	12	96	100	58	20	30	17	13			
B-103	15.0	3		10										
B-103	20.0	4	COMPOSITE	9										
B-104	1.0 - 15.0													
B-104	16.0		CLAYEY GRAVEL WITH SAND (GC)	9	120	64	44	17						
B-104	21.0		CLAYEY GRAVEL WITH SAND (GC)	13	123	90	63	27						
B-104	25.0			9	133									
B-104	40.0	8	META-SHALE (SC-SM)			81	66	29	20	13	7			
B-105	6.0		CLAYEY GRAVEL WITH SAND (GC)	27	94	80	45	14	32	22	10			
B-106	5.5			9	100									
B-106	11.0		SANDY LEAN CLAY (CL)	19	96			96	75	38	22	16		
B-107	5.5		META-GRAYWACKE			61	23	7.9						
B-108	10.0	2	META-SHALE (SC)	13		93	78	45	39	21	18			
B-108	28.5	6	META-SHALE(META-GRAYWACKE)	10		95	47	19						
B-108	33.5	7		9										
B-108	48.5	10	META-SHALE	10		100	86	28	23	13	10			
B-108	58.5	12		7										
B-108	73.5	15	META-GRAYWACKE	6	81	42	9.9							
B-108	93.5	18	SILTY META-SANDSTONE (SC)	11	100	98	82	38	33	22	11			
B-109	10.5		META-SHALE (SC)	7	127	98	59	17	26	17	9			
B-109	25.0	5												
B-109	26.0													

KLEINFELDER Bright People... Right Solutions.		PROJECT NO.: 136595 DRAWN BY: CAE		LABORATORY TEST RESULT SUMMARY	
		CHECKED BY: MJP DATE: 12/9/2013		State Road 36, Humboldt County CA FLAP SR36(13) FHWA-CFLHD	
		REVISED: 1/22/2014		Humboldt County, California	

TABLE B-1

Exploration ID	Approx. Sample Depth (ft.)	Sample No.	Sample Description	Moisture Content (%)	Dry Density (pcf)	Sieve Analysis			Atterberg Limits			Other Tests
						Passing 3/4 inch Sieve (%)	Passing #4 Sieve (%)	Passing #200 Sieve (%)	LL	PL	PI	
B-109	40.0 - 45.0	7	META-SHALE	7		78	29					
B-109	45.0	8		6					21	15	6	
B-110	15.0 - 30.0		META-GRAYWACKE									
B-110	20.0	4	META-GRAYWACKE	14		84	51	26				
B-110	35.0	7										
B-110	45.0	9	META-GRAYWACKE									
B-110	64.0		META-GRAYWACKE									
B-111	10.0 - 15.0		COMPOSITE									
B-111	10.5 - 15.5											
B-112	6.0		CLAYEY SAND WITH GRAVEL (SC)									
B-112	20.0	4		5	114				90	63	24	
B-112	25.0	5										
B-113	10.5		CLAYEY SAND WITH GRAVEL (SC)	9		88	69	31				
B-113	11.0			14								
B-113	31.0		CLAYEY SAND WITH GRAVEL (SC)									
B-113	36.0			7		86	72	29				
B-115	5.5		CLAYEY GRAVEL WITH SAND (GC)									
B-115	26.0			5	131							
B-115	40.5											
B-116	5.5 - 6.5		CLAYEY SAND WITH GRAVEL (SC)	8								
B-116	25.0 - 31.5	5	META-GRAYWACKE (GC)									
B-116	45.0 - 51.5	9	SERPENTINITE WITH META-GRAYWACKE (GW-GC)									
B-117	6.0			2	130							
B-117	7			7	108							

TABLE
LABORATORY TEST
RESULTS SUMMARY

B-2

State Road 36 Humboldt County
CA FLAP SR36(13)
FHWA-CFLHD
Humboldt County, California

PROJ
DRAW
CHECKED
DATE:
REVIS

TABLE

2

KLEINFELDER
Bright People. Right Solutions.

Exploration ID	Approx. Sample Depth (ft.)	Sample No.	Sample Description	Sieve Analysis				Atterberg Limits			Swell/Compression			Other Tests	
				Moisture Content (%)	Dry Density (pcf)	Passing 3/4 inch Sieve (%)	Passing #4 Sieve (%)	Passing #200 Sieve (%)	LL	PL	PI				
B-128	11.0 - 16.0		CLAYEY SAND WITH GRAVEL (SC)	13	119	72	30	30	16	14					
B-129	6.0 - 13.5		CLAYEY SAND WITH GRAVEL (SC)	14	115	67	18	30	16	14					
B-129	20.0	4	COMPOSITE	16											
B-130	1.0 - 10.0														
B-131	26.0		CGRAYEY SAND WITH GRAVEL (SC)	10	130	95	77	32	22	15	7				
B-131	31.0			7	137										
B-131	40.0 - 41.5	8	CGRAYEY SAND WITH GRAVEL (SC)			100	73	27							
B-131	46.0														
B-132	5.0 - 16.5	1	Poorly Graded Sand with CLAY AND GRAVEL (SP-SG)	8	140			61	12						
B-133	2.0 - 10.0		COMPOSITE					97	68	23	34	22	12		
B-133	8.5														
B-133	25.0 - 31.5	6	CGRAYEY SAND WITH GRAVEL (SC)			7	107								
B-133	31.0														
B-134	11.0														
B-134	25.0	5	CGRAYEY SAND WITH GRAVEL (SC)			15	123								
B-134	26.0														
B-134	30.0	6	CGRAYEY SAND WITH GRAVEL (SC)			10	116								
B-135	6.0 - 16.5		CGRAYEY GRAVEL WITH SAND (GC)					100	78	41					
B-135	15.0	4													
B-135	26.0		CGRAYEY SAND WITH GRAVEL (SC)			8	89	82							
B-136	6.0		CGRAYEY SAND WITH GRAVEL (SC)			6	122	100	82	49	29	16	13		
						14	102	100	78	30					
KLEINFELDER Bright People. Right Solutions.				PROJECT NO.:	136595	LABORATORY TEST RESULT SUMMARY				DRAWN BY:	CAE	MJP	TABLE		
				CHECKED BY:						DATE:	12/9/2013	State Road 36, Humboldt County CA FLAP SR36(13) FHWA-CFLHD	B-4		
				REVISED:	1/22/2014							Humboldt County, California			

KLEINFELDER
Bright People. Right Solutions.

State Road 36, Humboldt County
CA FLAP SR36(13)
FHWA-CFLHD
Humboldt County, California

KLEINFELDER - 611 Corporate Circle

Exploration ID	Approx. Sample Depth (ft.)	Sample No.	Sample Description	Moisture Content (%)	Dry Density (pcf)	Passing 3/4 inch Sieve (%)	Sieve Analysis			Atterberg Limits			Swell/Compression	Other Tests
							Passing #4 Sieve (%)	Passing #200 Sieve (%)	LL	PL	PI			
B-147	15.0 - 21.5	3	CLEYE SAND WITH GRAVEL (SC)	4		87	74	35	22	13	9			
B-147	20.0	4	CLEYE GRAVEL WITH SAND (GC)	9		82	66	39	32	18	14			
B-148	5.5 - 6.5					8	125							
B-148	6.0					7	119							
B-148	16.0					11								
B-148	25.0	5				7	141							
B-148	31.0					8	91							
B-149	6.0					5	118							
B-149	16.0		CLEYE SAND WITH GRAVEL (SC)			98	83	43	33	16	17			
B-149	20.0 - 26.5	4				18	118							
B-149	46.0					19								
B-149	55.0	11	META-SHALE			14	123							
B-149	61.0					11								
B-149	65.0	13	META-SHALE											
B-149	85.0 - 91.5	17	CLEYE SAND WITH GRAVEL (SC)			97	74	38	24	15	9			
B-151	20.0 - 26.5	5	SANDY LEAN CLAY WITH GRAVEL (CL)			100	79	50						
B-152	31.0					11	128							
B-152	36.0		SANDY LEAN CLAY (CL)			100	87	53	36	15	21			
B-152	45.0 - 51.5	8	Poorly Graded GRAVEL WITH SILT AND SAND (GP-GM)			93	47	10						
B-153	11.0					7	109							
B-153	16.0		CLEYE GRAVEL WITH SAND (GC)											
B-153	20.5 - 21.5		CLEYE GRAVEL WITH SAND (GC)			12	81	51	24	16	8			
B-154	20.5 - 21.5		COMPOSITE			91	62	25	29	15	14			
B-155	2.0 - 15.0													

KLEINFELDER Bright People. Right Solutions.		PROJECT NO.: 136595 DRAWN BY: CAE CHECKED BY: MJP DATE: 12/9/2013 REVISED: 1/22/2014	LABORATORY TEST RESULT SUMMARY State Road 36, Humboldt County CA FLAP SR36(13) FHWA-CFLHD Humboldt County, California
TABLE B-6			



Exploration ID	Approx. Sample Depth (ft.)	Sample No.	Sample Description	Moisture Content (%)	Sieve Analysis			Atterberg Limits			Swell/Compression			Other Tests
					Dry Density (pcf)	Passing 3/4 inch Sieve (%)	Passing #4 Sieve (%)	Passing #200 Sieve (%)	LL	PL	PI	Sulfates= N.D.	pH= 8.25	Resistivity= 3,100
B-155	5.0	1	CLAYEY GRAVEL WITH SAND (GC)	15	114	93	43	16	30	17	13			
B-156	15.5	4	CLAYEY SAND WITH GRAVEL (SC)	25	100	91	36	NV	NP	NP				
B-157	20.0	4	SILTY SAND (SM)	91	40	15	27	17	10					
B-158	5.5 - 6.5		CLAYEY GRAVEL WITH SAND (GC)	5										
B-158	6.0		CLAYEY GRAVEL WITH SAND (GC)											
B-158	24.0		CLAYEY GRAVEL WITH SAND (GC)											
B-159	2.0 - 15.0		CLAYEY GRAVEL WITH SAND (GC)											
B-159	6.0		CLAYEY SAND WITH GRAVEL (SC)	13	97	100	63	19	39	25	14			
B-159	11.0		CLAYEY SAND WITH GRAVEL (SC)	12	113	100	76	38						
P-101	5.0	1	Poorly Graded GRAVEL WITH CLAY AND SAND (GP-GC)		76	48	9.5							
P-101/P102	20.0		Poorly Graded GRAVEL WITH CLAY AND SAND (GP-GC)		91	55	8.6							
P-102	5.0	1												
P-103	10.0 - 11.0	2	Poorly Graded GRAVEL SAND (GP)		57	28	4.9							
P-104/107/108	0.0 - 10.0		CLAYEY GRAVEL WITH SAND (GC)		83	44	16	30	18	12				R-Value = 53
P-106	6.0 - 10.0		Poorly Graded GRAVEL SAND (GP)		62	38	7.2							
P-107	5.0 - 6.0	1	CLAYEY SAND WITH GRAVEL (SC)		100	72	31	39	25	14				
P-107	15.0 - 20.0	3	CLAYEY GRAVEL WITH SAND (GC)		82	55	14	45	20	25				
P-108	4.0 - 9.0	1	Poorly Graded GRAVEL WITH CLAY AND SAND (GP-GC)		88	47	8.2	33	19	14				

TABLE

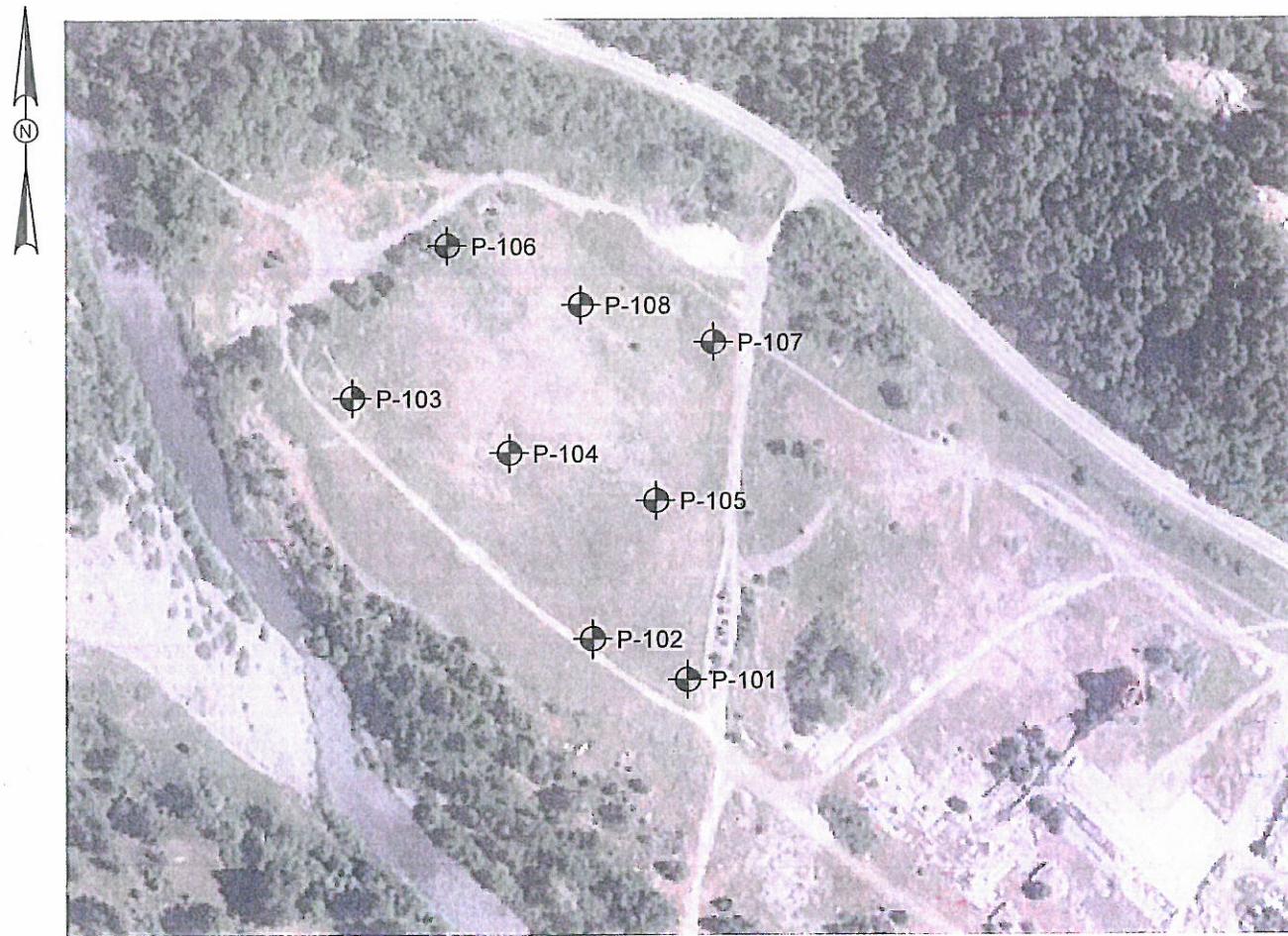
B-7

LABORATORY TEST
RESULT SUMMARY

PROJECT NO.: 13695
 DRAWN BY: CAE
 CHECKED BY: MJP
 DATE: 12/9/2013
 REVISED: 1/22/2014

KLEINFELDER
 Bright People. Right Solutions.

State Road 36, Humboldt County
 CA FLAP SR36(13)
 FHWA-CFLHD
 Humboldt County, California



0 200 400
SCALE: 1" = 200' SCALE IN FEET

SITE MAP



LEGEND

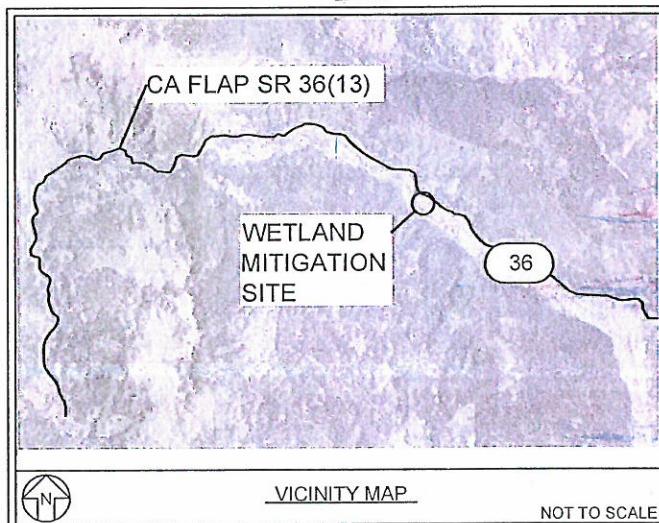


PIEZOMETER LOCATION

NOTES:

1. BASE MAPPING CREATED FROM USGS THE NATIONAL MAP VIEWER DATE CREATED 12/06/13

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



Laboratory Test Report

Project Name: CA Flap SR 36

Project No.: 136595

Lab No.: HL6233

Sample Date: SEPT/OCT 2013

Sample No.: HL6233A

Sample Location: B104 (1'-5')

Material Description: Poorly Graded Gravel with Clay and Sand (GP-GC)

Report Date: November 18, 2013

Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
(ASTM C 131, Grading B)

Number of Revolutions	% Loss	Specification
100	6	--
500	21	--

 KLEINFELDER Bright People. Right Solutions.	PROJECT NO.:	136595	LA ABRASION	PLATE B-48
	DRAWN BY:	RS		
	CHECKED BY:	CP	State Road 36, Humboldt County CA FLAP SR36(13) FHWA-CFLHD Humboldt County, California	
	DATE:	12/4/2013		
	REVISED:			

Laboratory Test Report

Project Name: STATE ROUTE 36 HUMBOLDT COUNTY

Project No.: 136595

Lab No.: HL6369

Sample Date: December 19, 2013

Sample No.: COMPOSITE

Sample Location: P-104 / P-107 / P-108 @ 0'-10'

Material Description: Clayey Gravel with Sand (GC)

Report Date: January 2, 2014

Abrasion of Coarse Aggregate by Use of the Los Angeles Rattler Machine (CTM 211, Grading A)

Number of Revolutions	% Wear	Specification
100	5	--
500	24	--

 KLEINFELDER Bright People. Right Solutions.	PROJECT NO.:	136595	LA ABRASION	PLATE
	DRAWN BY:	RS	State Road 36, Humboldt County CA FLAP SR36(13) FHWA-CFLHD Humboldt County, California	B-49

APPENDIX C

PHOTOGRAPHS

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLT COUNTY

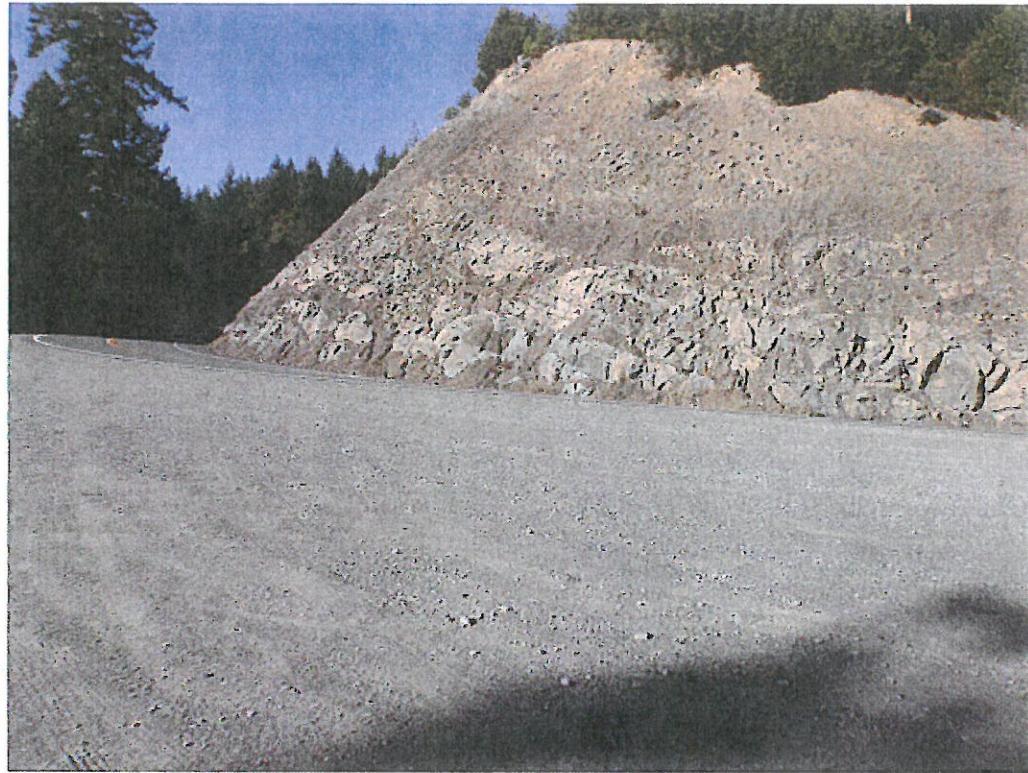


~ MP 36.0 Begin Project looking east



~ MP 36.25 Typical lack of shoulder, looking east

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLDT COUNTY



~ MP 36.75 Rock area, pullout left, looking east



~ MP 36.8 Slide area with multiple pavement lifts for leveling

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLT COUNTY



~ MP 36.5 Tight radii curve and oversize load stuck



~ MP 36.5 Oversize load high centered on horizontal and vertical curves

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLDT COUNTY

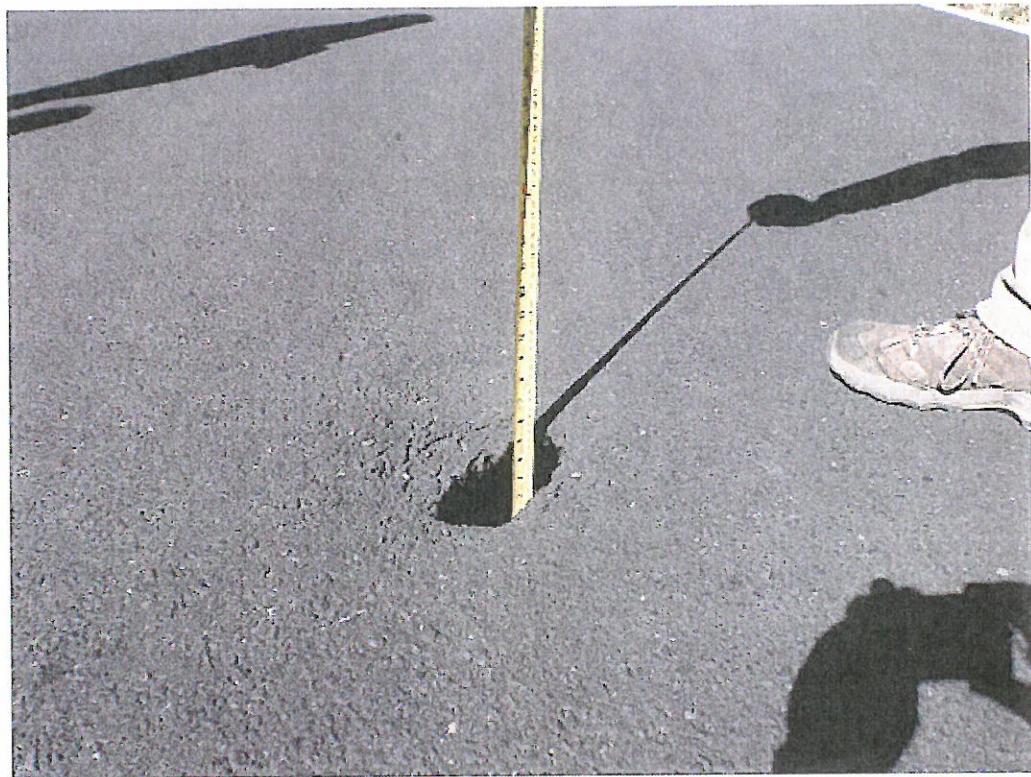


~ MP 36.5 Oversize load working back & forth to navigate the curve



~ MP 36.5 Oversize trucks was directed by permitting office to use SR 36

CA FLAP SR 36 (13) CALIFORNIA STATE ROUTE 36 HUMBOLT COUNTY



~ MP 38.4 Void beneath 6-month old pavement patch in slide area



~ MP 38.4 This portions of SR 36 is overlaid at least once a year due to slides.

APPENDIX D

PAVEMENT DESIGN CALCULATIONS

1993 AASHTO Pavement Design
DARWin Pavement Design and Analysis System
A Proprietary AASHTOWare
Computer Software Product
Flexible Structural Design Module

CA FLAP SR 36(13) VAN DUZEN PEANUT

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	618,600
Initial Serviceability	4.2
Terminal Serviceability	2.5
Reliability Level	75 %
Overall Standard Deviation	0.49
Roadbed Soil Resilient Modulus	4,000 psi
Stage Construction	1
Calculated Design Structural Number	3.71 in

Specified Layer Design

<u>Layer</u>	<u>Material Description</u>	Struct <u>Coef.</u> <u>(Ai)</u>	Drain <u>Coef.</u> <u>(Mi)</u>	Thickness <u>(Di)(in)</u>	Width <u>(ft)</u>	Calculated <u>SN (in)</u>
1	HACP	0.44	1	6	-	2.64
2	Base Course	0.12	1	9	-	1.08
Total	-	-	-	15.00	-	3.72

Deppmeier, Steve (FHWA)

From: Johnson, Wesley D@DOT <wesley.johnson@dot.ca.gov>
Sent: Friday, March 28, 2014 3:18 PM
To: Mullen, Richard D@DOT
Cc: Herlyck, James (FHWA); Deppmeier, Steve (FHWA); Fitzgerald, Tom J@DOT
Subject: CA RT HUM 036, FLAP 36 (13), EA 01-43730, Structural Section and Detour Structural Section

Hello Richard:

I have reviewed the proposed structural section provided by Mr. Steve Deppmeier of the FHWA – CFLHD for the HUM 36 “Buck Mountain” roadway project. Initially, we were in disagreement as to the final thickness to be used as our department historically uses the “Hveem” method of roadway design which has proven to be conservative in its results. Recently, California DOT began using the CalME Design program which is Caltrans’ version of the Mechanistic-Empirical design method which slightly differs from the program used by the FHWA (DARWin Pavement Design and Analysis System). Having reviewed results from parameters in the CalME program and in discussion with Headquarters ME Design personnel, I concur with the proposed FHWA structural section design which based on TI of 9.5 and R-value of 15 and is repeated below:

<u>HMA-A</u>	<u>Aggregate Base (CI 2)</u>
0.50 feet	0.75 feet

Additionally, as we discussed in the recent PDT, there is an available stockpile of spoils with R-values of 50 or greater which can be used for sub-base where fill needs to be imported. Also, I have generated detour structural section data for a temporary 6 month surface to handle traffic. I believe that there may be detours both in and out of the permanent alignment, depending on proposed phase construction. Both are presented below and are based on hybrid ME Design /Hveem method.

Temporary 6 month detour (in permanent alignment):

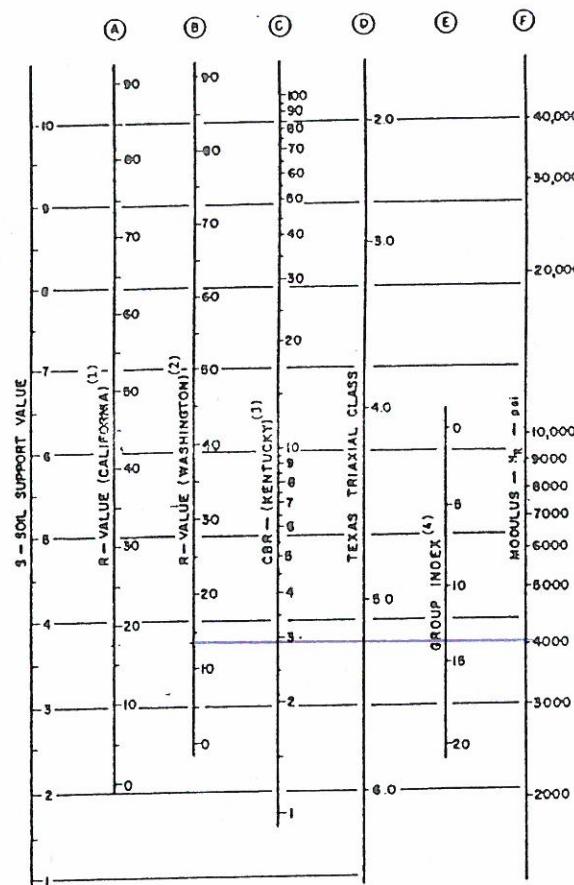
<u>HMA-A</u>	<u>Aggregate Base (CI 2)</u>
0.30 feet	0.75 feet

Temporary 6 month detour (outside permanent alignment):

<u>HMA-A</u>	<u>Aggregate Base (CI 2)</u>
0.30 feet	0.50 feet

Please feel free to call if you have any questions. Have a great weekend.

Wesley D. Johnson
D1 Materials Engineering
1726 Albee Street
Eureka, CA 95501
707-445-6386
wesley_johnson@dot.ca.gov



Design R-Value of
15 = 4000 psi

- (1) The correlation is with the design curves used by California; AASHTO designation is T-173-60, and load pressure is 240 psi. See Hveem, F.M., and Carney, R.M., "The Factors Underlying the Rational Design of Pavements," *Proc. HRB*, Vol. 28 (1948) pp. 101-136.
 (2) The correlation is with the design curves used by Washington Dept. of Highways; load pressure is 300 psi. See "Flexible Pavement Design Correlation Study," *HRB Bull.* 133 (1956).
 (3) The correlation is with the CRRI design curves developed by Kentucky. See Drake, W.B., and Havens, J.H., "Re-Evaluation of Kentucky Flexible Pavement Design Criterion," *HRB Bull.* 233 (1959) pp. 33-56. The following conditions apply to the laboratory-modified CRRI specimen to be molded at or near the optimum moisture content as determined by AASHTO T-99; dynamic compaction is to be used with a hammer weight of 10 lb dropped from a height of 18 in.; specimen is to be compacted in five equal layers with each layer receiving 10 blows; specimen is to be soaked for 4 days.
 (4) This scale has been developed by comparison between the California R-value and the Group Index determined by the procedure in *Proc. HRB* Vol. 25 (1945) pp. 376-392.

Figure FF.6. Correlation chart for estimating soil support (1).

Deppmeier, Steve (FHWA)

From: Johnson, Wesley D@DOT <wesley.johnson@dot.ca.gov>
Sent: Friday, May 16, 2014 8:38 AM
To: Deppmeier, Steve (FHWA)
Subject: RE: CA FLAP SR 36 (13) HUMBODLT COUNTY MP 36 to 39.9

Good Morning;

Yes. You could also use PG 64-28 PM; or, a combination layer thickness with up to 0.20 ft RHMA-G using Pg 64-16 assuming tonnage is greater than 10,000 tons for RHMA-G.

Wesley D. Johnson
D1 Materials Engineering
1726 Albee Street
Eureka, CA 95501
707-445-6386
wesley_johnson@dot.ca.gov

From: Steve.DEPPMEIER@dot.gov [mailto:Steve.DEPPMEIER@dot.gov]
Sent: Thursday, May 15, 2014 2:01 PM
To: Johnson, Wesley D@DOT
Subject: CA FLAP SR 36 (13) HUMBODLT COUNTY MP 36 to 39.9

For PG binders, the Caltrans Climate Region map recommends PG 64-16. Is this the PG binder you would recommend?

Steve Deppmeier
Materials & Pavements Engineer
FHWA – CFLHD
720-963-3504

The Weather Channel

1 60°F Peanut, CA 1 62°F Bridgeville, CA 1 57°F Mad River, CA

FORECASTS MAPS VIDEO PHOTOS NEWS TV

Search Zip, City, or Place (Disney World)

RSS Share Email Bookmark Print

Sign In Alerts Photos Desktop App

Home Weather Monthly Weather for Bridgeville

Local Pollen Forecast

> State Warnings for CA

Very High Pollen Level

[Right Now](#) [Today](#) [Hourly](#) [Tomorrow](#) [Weekend](#) [5 day](#) [10 day](#) [Monthly](#) [Map](#)

Monthly Averages for
Bridgeville, CA
[English | Metric]

Monthly Averages Table Display Graph Display

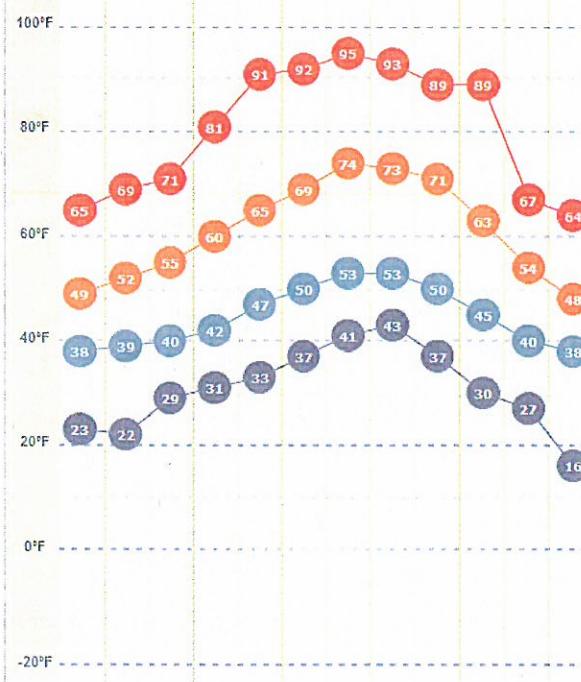
Temperature (°F)

Avg High Record High Avg Precip.

Avg Low Record Low

Legend: ● Record High ● Average High ● Average Low ● Record Low ■ Precip

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



5 Foods to never eat:

Cut down a bit of killer fat every day by never eating these 5 foods.

NEVER EAT

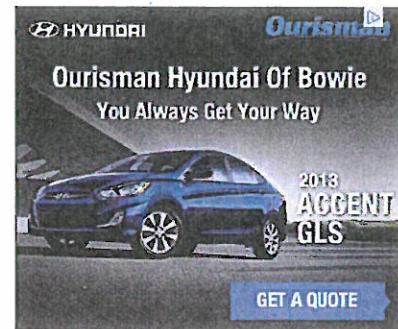
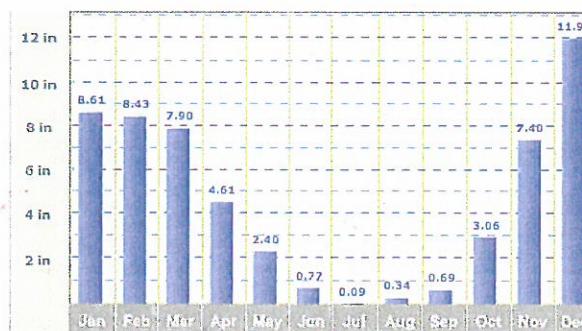
Today's Top Picks

- Will to Live: Take on Nature, Struggle to Survive This Sunday 9/8c
- Gorgeous Photos of Hearst Castle
- BIZARRE Homes You Have to See to Believe (PHOTOS)
- White House Lawns Throughout the Years (PHOTOS)
- Top 10 World's Best Airports
- Tornado Alert! Find Out Who's at Risk
- America's Morning Headquarters with Sam Champion
- Highway Thru Hell: Electrifying Tow

SolarCity

Check Availability ▶

solarcity.com



Bridgeville, CA Weather Facts

- On average, the warmest month is July.
- The highest recorded temperature was 95°F in 1990.
- On average, the coolest month is January.
- The lowest recorded temperature was 16°F in 1990.
- The maximum average precipitation occurs in December.

[Details](#) [Video](#) [Text](#) [Averages](#)

More Resources

- Golf Tips: Beat the Weather
- Find Local Golf Courses
- Near Bridgeville, CA
- OR
- Enter Course Name **GO!**
- Top 10 Golf Destinations
- Local Pollen Levels
- Surf Conditions

[Right Now](#) [Today](#) [Hourly](#) [Tomorrow](#) [Weekend](#) [5 day](#) [10 day](#) [Monthly](#) [Map](#)

Enter Search Term

SEARCH Search Web Search Site

Company

[Sitemap](#)
[Support](#)
[Feedback](#)
[Careers](#)
[About Us](#)
[Press Room](#)
[Advertising](#)

Explore

[Storm Encyclopedia](#)
[Weather Glossary](#)
[Top 100 U.S. Cities](#)
[Search by State](#)
[City Guides](#)
[Hurricanes](#)
[Top Social Weather Cities](#)
[TOR.CON](#)

Partners

[The Home Depot Project of the Week](#)
[WebMD Asthma & Allergy Center](#)
[Web Hosting at GoDaddy.com](#)
[Breaking News](#)

Our Products

[Desktop Weather](#)
[Mobile Products](#)
[Weather API](#)
[Weather Tools](#)
[Toolbars](#)
[Screensavers](#)
[Email/SMS Alerts](#)

Like us

[Follow us](#)
[Add us](#)
[Watch us](#)

Weather on Mobile

[Download Desktop Weather](#)

© 1995 - 2012, The Weather Channel, LLC weather.com® Licensed by TRUSTe
[Terms of Service](#) [Privacy Statement](#) [Parental Controls](#) [Ad Choices](#)

APPENDIX E

TRAFFIC DATA

Memorandum

*Flex your power!
Be energy efficient!*

To: Wesley Johnson
Eureka-D1 Materials Date: 09/24/2013

From: Susan Zanchi, Chief
Office of Travel Forecasting and Modeling File: 01-HUM-36
EA: 01-43730X
EFIS: 0112000180

Susan Zanchi

Re: TRAFFIC DATA & DESIGNATION REQUEST

The traffic data that you requested via email on 08/29/2013 is listed below. The Traffic Index (TI) design periods are 10 and 20-year projections.

County	HUM
Highway	36
Post Mile	36.0_41.0
Annual ADT	
Base Year	
2013	1,070
2017	1,110
2027	1,220
2037	1,320
Peak Hour	
Base Year	
2013	140
2017	150
2027	160
2037	180
Directional %	60
DH Truck %	6.0
10-year TI	7.5
20-year TI	8.5
10-year ESAL	216,100
20-year ESAL	618,600

If you have any questions or need additional information, please contact Tim Trinh at (530) 741-5175.

cc: Files

APPENDIX F

FIELD DATA SUMMARY

<u>Milepost</u>	<u>Caltrans HACP (inches)</u>	<u>CFL HACP (inches)</u>	<u>Kleinfelder HACP (inches)</u>	<u>Caltrans R-Value</u>	<u>CFL R-Value</u>	<u>Kleinfelder R-Value</u>
35.95	6.75					
36.27		6.00				30
36.45	7.00					
36.73		8.00				17
36.95	9.00					
37.22		48				69
37.39		8.00				
37.42		9.60			15	
37.45	9.50					
37.64		6.00				
37.67		6.00				
37.83		12.00				63
37.95	9.00					
38.13		off alignment				7
38.45	7.00					
38.87		12.00			18	
38.90				39		
38.95	6.00					
39.00				14		
39.10				13		
39.13		7.00				14
39.26		6.00				
39.28		6.00				
39.36		9.60				
39.44		24.00				
39.45	13.50					
39.50				15		
39.71		6.00				14
39.95	10.00					
40.39				13		
40.45	6.75					

average of HACP (inches) =
excluded 48 inches HACP core

8.78

average R-Values =
excluded the two highest R-Values

17

**01-0A0204 - FOR CONSTRUCTION ON STATE HIGHWAY IN HUMBOLDT COUNTY
NEAR DINSMORE FROM SOUTH FORK VAN DUZEN RIVER BRIDGE**

TO VAN DUZEN RIVER BRIDGE					
PROJECT ID #	11-1001.206	11-1001.206	11-1001.206	11-1001.206	11-1001.206
DATE CORED	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11
CORE NUMBER	1	2	3	4	5
Type of Material Recovered	Asphalt Concrete				
Underlying	1" Aggregate Base				
Total core thickness	6.75"	10.0"	13.5"	6.0"	7.0"
Thickness of each individual material	6.75" AC	10.0" AC	13.5" AC	6.0" AC	7.0" AC
INDIVIDUAL CORE LOCATION INFORMATION					
COUNTY	Humboldt County	Humboldt County	Humboldt County	Humboldt County	Humboldt County
ROUTE	36	36	36	36	36
POST MILE	40.45	39.95	39.45	38.95	38.45
LANE NUMBER	1	1	1	1	1
LANE DIRECTION	WB	WB	WB	WB	WB
STATION	NK	NK	NK	NK	NK

**01-0A0204 - FOR CONSTRUCTION ON STATE HIGHWAY IN HUMBOLDT COUNTY
NEAR DINSMORE FROM SOUTH FORK VAN DUZEN RIVER BRIDGE
TO VAN DUZEN RIVER BRIDGE**

PROJECT ID #	11-1001.206	11-1001.206	11-1001.206	11-1001.206
DATE CORED	25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11
CORE NUMBER	6	7	8	9
Type of Material Recovered	Asphalt Concrete	Asphalt Concrete	Asphalt Concrete	Asphalt Concrete
Underlying	1" Aggregate Base	1" Aggregate Base	1" Aggregate Base	1" Aggregate Base
Total core thickness	9.0"	9.5"	9.0"	7.0"
Thickness of each individual material	9.0" AC	9.5" AC	9.0" AC	7.0" AC
INDIVIDUAL CORE LOCATION INFORMATION				
COUNTY	Humboldt County	Humboldt County	Humboldt County	Humboldt County
ROUTE	36	36	36	36
POST MILE	37.95	37.45	36.95	36.45
LANE NUMBER	1	1	1	1
LANE DIRECTION	WB	WB	WB	WB
STATION	NK	NK	NK	NK

01-0A0204 - FOR CONSTRUCTION ON STATE HIGHWAY IN HUMBOLDT COUNTY
 NEAR DINSMORE FROM SOUTH FORK VAN DUZEN RIVER BRIDGE
 TO VAN DUZEN RIVER BRIDGE

PROJECT ID #	11-1001.206	DATE CORED	25-Oct-11
CORE NUMBER	11	Type of Material Recovered	Asphalt Concrete
Underlying	1" Aggregate Base		
Total core thickness	7.0"		
Thickness of each individual material	7.0" AC		
INDIVIDUAL CORE LOCATION INFORMATION			
COUNTY	Humboldt County	ROUTE	36
POST MILE	35.43	LANE NUMBER	1
LANE DIRECTION	WB	STATION	NK











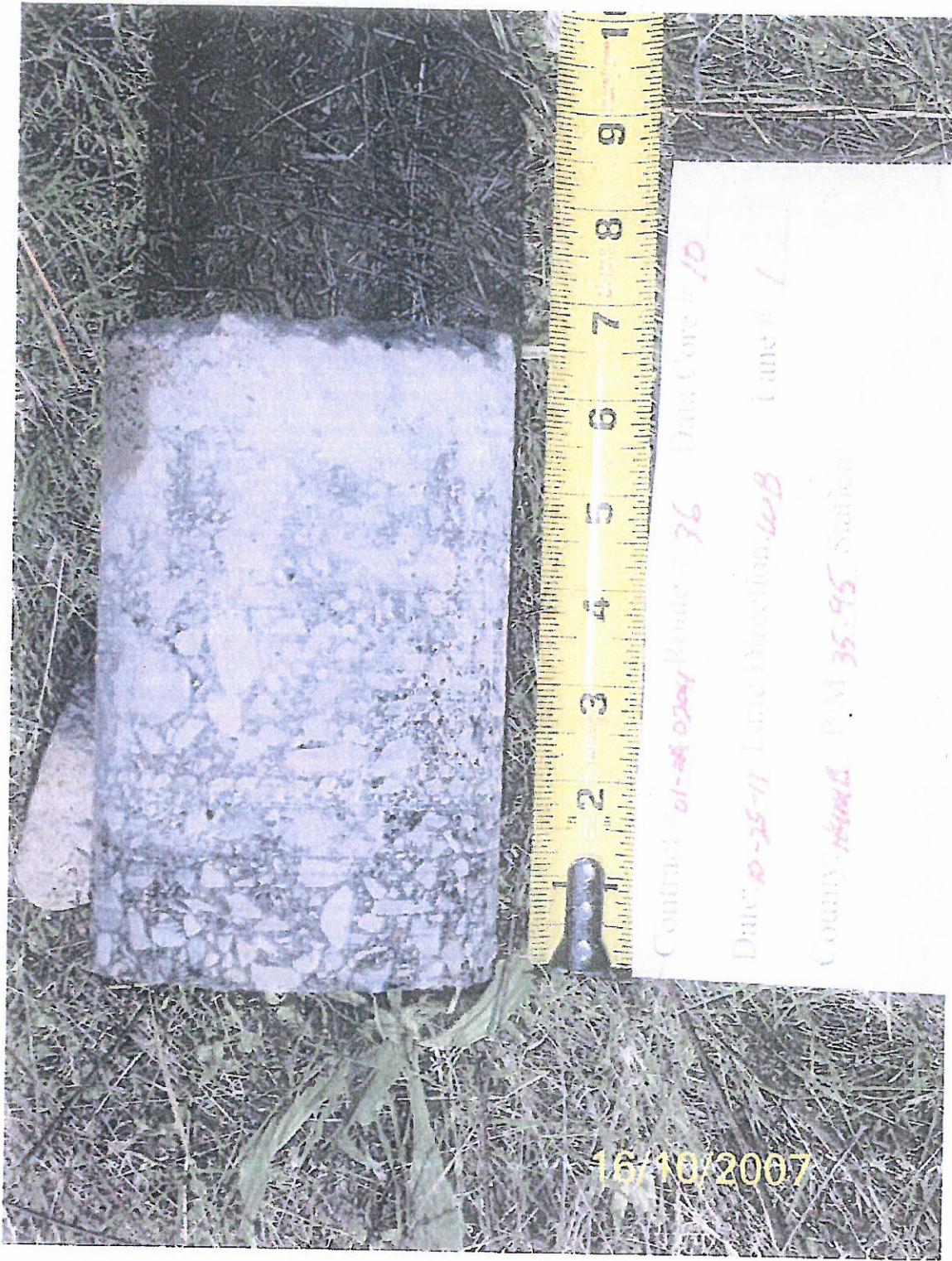


10-10-2007

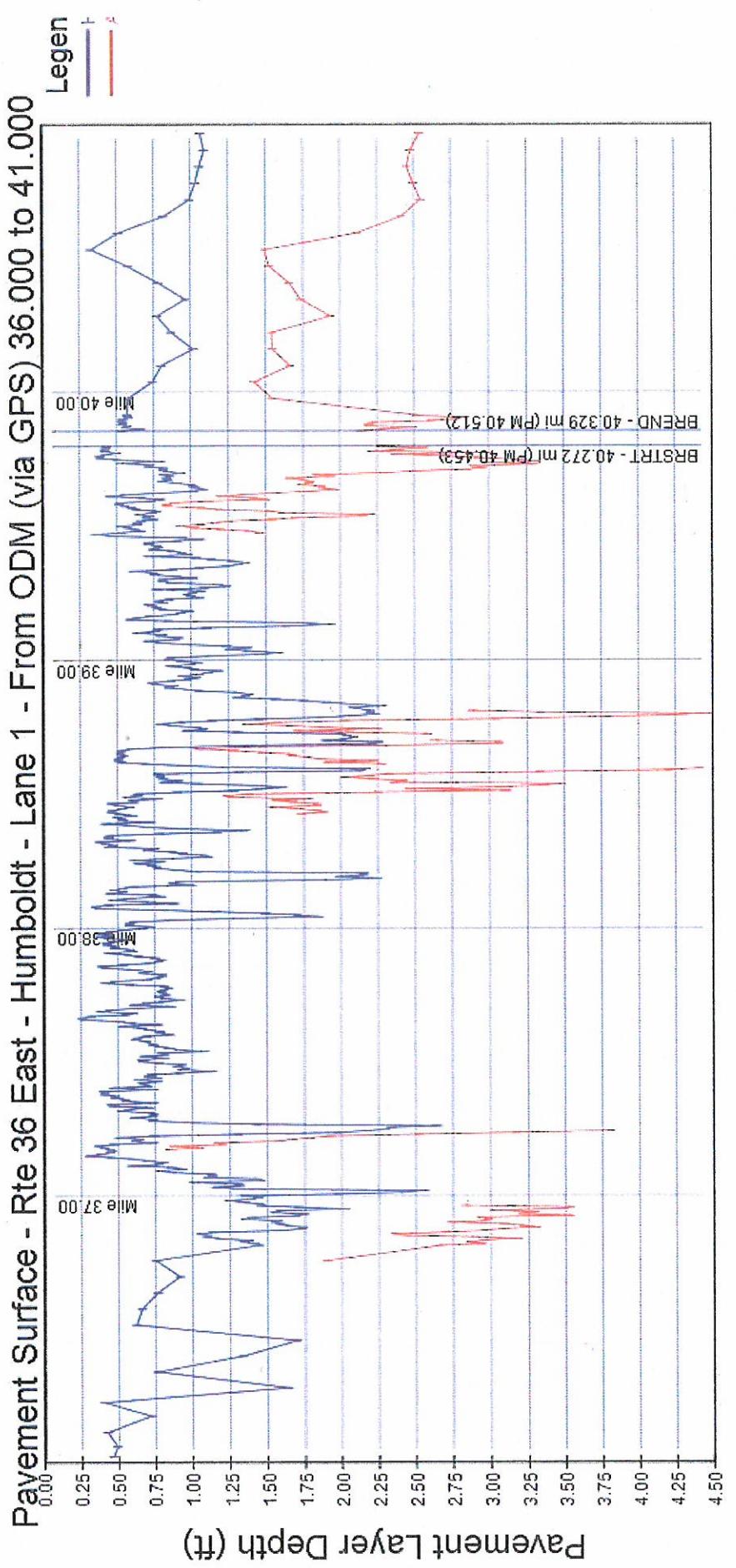












41.104
41.000
Plot:
LRS
ODM: 36.000
36.104